

**FINDING OF NO SIGNIFICANT IMPACT:
REPLACEMENT OF CHEMICAL CLEANING LINE
TINKER AIR FORCE BASE
OKLAHOMA CITY, OKLAHOMA**

An Environmental Assessment (EA) has been prepared to assess the potential effects on the human and natural environment of replacing the chemical cleaning line at Tinker Air Force Base (AFB) in Oklahoma City, Oklahoma. This action would remedy the current inadequacy of the existing chemical cleaning line to accommodate larger engine parts and future workload. Replacement of the existing cleaning line would provide a more energy-efficient operation that would reduce water and chemical use, generate cost savings for overall cleaning line system operations, and accommodate larger engine parts.

The EA has been prepared pursuant to the Council on Environmental Quality's (CEQ's) regulations for implementing the procedural provisions of the National Environmental Policy Act (NEPA), codified at Title 40, Code of Federal Regulations Parts 1500-1508 (40 CFR 1500-1508), and Air Force Instruction (AFI) 32-7061, entitled *Environmental Impact Analysis Process* (EIAP) and codified at 32 CFR 989. The EA is incorporated by reference into this finding.

DESCRIPTION OF PROPOSED ACTION: The Proposed Action is to renovate and improve the existing cleaning line system in Building 3001 (B3001) at Tinker AFB by providing improved system monitors and controls, reducing the overall energy consumption of the system, and enabling the system to accommodate larger engine parts. Implementation of this action would provide an aircraft engine cleaning line capable of accommodating current and programmed workload in a manner that provides better system control, energy efficiency, and improved occupational safety.

Implementing the Proposed Action would enable the system to accommodate workload in a manner that is more energy efficient, easier to operate, and safer. No increase in workload would occur as part of the Proposed Action.

IDENTIFIED ALTERNATIVES: Alternatives for implementation of the Proposed Action have been considered, and three were identified to be carried forward for further analysis, including the No-Action Alternative.

Description of Alternative 1: Implementation of Alternative 1, the Preferred Alternative, would be implemented in phases. A phased approach throughout all renovation activities would allow for the cleaning line to remain partially in operation during construction activities and would minimize impacts on workload capacity during renovations. A preliminary phase of the project included building a new small-parts cleaning line and a reverse-osmosis water treatment system; that effort is currently under way. Phasing of the cleaning line renovations would occur in Fiscal Year 2012 (FY12) through FY13.

Report Documentation Page				Form Approved OMB No. 0704-0188	
Public reporting burden for the collection of information is estimated to average 1 hour per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to Washington Headquarters Services, Directorate for Information Operations and Reports, 1215 Jefferson Davis Highway, Suite 1204, Arlington VA 22202-4302. Respondents should be aware that notwithstanding any other provision of law, no person shall be subject to a penalty for failing to comply with a collection of information if it does not display a currently valid OMB control number.					
1. REPORT DATE MAY 2012		2. REPORT TYPE		3. DATES COVERED 00-00-2012 to 00-00-2012	
4. TITLE AND SUBTITLE Finding of No Significant Impact: Replacement of Chemical Cleaning Line Tinker Air Force Base Oklahoma City, Oklahoma				5a. CONTRACT NUMBER	
				5b. GRANT NUMBER	
				5c. PROGRAM ELEMENT NUMBER	
6. AUTHOR(S)				5d. PROJECT NUMBER	
				5e. TASK NUMBER	
				5f. WORK UNIT NUMBER	
7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) AMEC Earth and Environmental, Inc, 104 W Anapamu St Ste 204a, San Barbara, CA, 93101				8. PERFORMING ORGANIZATION REPORT NUMBER	
9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES)				10. SPONSOR/MONITOR'S ACRONYM(S)	
				11. SPONSOR/MONITOR'S REPORT NUMBER(S)	
12. DISTRIBUTION/AVAILABILITY STATEMENT Approved for public release; distribution unlimited					
13. SUPPLEMENTARY NOTES					
14. ABSTRACT					
15. SUBJECT TERMS					
16. SECURITY CLASSIFICATION OF:			17. LIMITATION OF ABSTRACT Same as Report (SAR)	18. NUMBER OF PAGES 109	19a. NAME OF RESPONSIBLE PERSON
a. REPORT unclassified	b. ABSTRACT unclassified	c. THIS PAGE unclassified			

Renovations scheduled for the first phase would repair the current control system with a programmable logic controller. The new programmable logic controller and associated equipment, remote input/output blocks, proximity sensors, and communication sensors would replace the outdated control hardware and software currently used. This would enable the cleaning shop to work more effectively as well as have a system that is more reliable and maintainable. During these renovation activities, production along the cleaning line would continue to accommodate workload; at least one process line capable of accommodating long processes and multistep alkaline cleaning would remain operational at any given time. However, parts requiring paint stripping would be redirected to B3221, located to the east of B3001, towards the southern end of B3001, south of 44th Street. B3221 has existing facilities capable of accommodating a portion of the redirected existing cleaning line workload for paint removal operations.

The first phase would also include developing the configuration of the new chemical and rinse tank layout, designing the remote system control model for working tanks, demolishing process lines 4 – 6, and building one new process line in the open area.

- Replacement of process tanks
- Refurbishment/restoration of concrete tank piers, and laying new piers as necessary
- Installation of cleaning line sensors and controls
- Installation of heating loops
- Installation of water recycling loops
- Installation of new transport system designed for the new line
- Control system design and installed sized for final shop design
- Installation of necessary ventilation and make up air units
- Installation of 1 hour fire rated enclosure

The system would be designed towards a final product similar to the automatic cleaning line in B3001. The new line would contain 12 to 14 tanks, and the transport system would be a gantry style hoist system that is non-dedicated that allows tanks and baskets to be bypassed. Production would continue on process lines 1, 2, and 3 along with the automatic cleaning line for the short, one-step cleaning processes. Paint stripping capability would be moved to process line 2. B3221 facilities would be used as needed, dependent on workload. An equipment platform to house fume scrubbers and makeup air units would be installed on the roof of B3001 as part of this project phase. The Preferred Alternative may require four fume scrubber/fan assemblies that are each approximately 24 feet in length, 12 feet in width, and 9 feet-8 inches in height. If it is determined that new fume scrubbers would be required for the proposed project, the existing fume scrubbers would be replaced with new fume ones. Exposed portions of the new fume scrubbers would be constructed of non-galvanized materials.

Activities conducted during the second phase would include installation of two new process lines that would use the same control system developed in the second phase of the project. One of the new lines would be a mirror image of the line built in the second phase, capable of performing all steel cleaning processes. The other line would have a short process line designed for paint stripping, and is planned to contain three larger tanks designed to accommodate larger engine parts.

The Preferred Alternative would include the removal of piping, chemical tanks, insulation, and floor deposits and residues; some of these materials may contain hazardous materials and would require proper handling and disposal. To meet International Building Code use and occupancy requirements, various fire suppression and detection measures would be incorporated as part of the Preferred Alternative.

Description of Alternative 2: Under Alternative 2, all cleaning line components would be replaced simultaneously. Alternative 2 would require complete shutdown of the cleaning line in B3001 and redirection of the workload to B3221 until replacement of the cleaning line is complete. B3221 has existing facilities that can accommodate a portion of the current cleaning line workload. Implementation of Alternative 2 could occur within one or two years, which would allow for faster replacement of the cleaning line due to complete shutdown; however, the B3221 does not have capacity to accommodate the entire current cleaning line workload.

Similar to the Preferred Alternative, Alternative 2 would generate exposure of hazardous materials (e.g., chemical residues) during renovation efforts. As with the Preferred Alternative, Alternative 2 would provide an updated cleaning line system that would conserve approximately \$2.76 million in utility costs per year. Under Alternative 2, more funding would be required per year due to the non-phased approach and shorter construction duration. Implementation of Alternative 2 would also result in a more energy-efficient cleaning line than currently exists with the capacity and flexibility to accommodate current and future workload.

Description of No-Action Alternative: Under the No-Action Alternative, Tinker AFB would not implement the Proposed Action, and the cleaning line in B3001 would not be improved or renovated to streamline the operational flow, improve safety, or better accommodate current and future workload.

Although this alternative would not fulfill the purpose and need of the Proposed Action, it will be carried forward as required by the CEQ. CEQ's regulations for the implementation of NEPA stipulate that the No-Action Alternative must be considered to assess environmental consequences that may occur if the Proposed Action is not implemented.

SUMMARY OF FINDINGS FOR ALTERNATIVES

Resource/Issue	Preferred Alternative	Alternative 2	No-Action Alternative
Air Quality	<p>No ground-disturbing activities would occur. Temporary (short-term) negligible construction emissions (i.e., construction dust) generated during renovation activities in B3001.</p> <p>Temporary combustion emissions from vehicles and equipment used during renovation activities in B3001. Greenhouse gas emissions resulting from construction-related vehicles would result in minimal impacts.</p> <p>Long-term beneficial impacts on operational emissions from installation of energy-efficient utilities.</p> <p>Long-term beneficial impacts on indoor air quality from installation of a new, improved cleaning line ventilation system.</p>	<p>Long-term beneficial impacts would be the same as those described for the Preferred Alternative; however, the beneficial impacts would occur sooner than under implementation of the Preferred Alternative due to a compressed work schedule (non-phased approach).</p> <p>Temporary impacts would be similar to those described for the Preferred Alternative; however, proposed construction activities would occur over a shorter time period.</p>	<p>Conditions would remain as described in Section 3.1, <i>Air Quality</i>.</p>
Cultural Resources	<p>No adverse effect on cultural resources would occur. There would be no significant change in the character-defining features of B3001 and no impacts on visual aesthetics.</p>	<p>Impacts on cultural resources would be the same as those described for the Preferred Alternative.</p>	<p>Conditions would remain as described in Section 3.2, <i>Cultural Resources</i>.</p>

SUMMARY OF FINDINGS FOR ALTERNATIVES (Continued)

Resource/Issue	Preferred Alternative	Alternative 2	No-Action Alternative
Hazardous Materials and Wastes	<p>No impacts on or resulting from groundwater contamination, hazardous materials storage sites, or hazardous waste storage sites.</p> <p>Negligible impacts resulting from potential generation of regulated waste from heavy-metal dust, soil vapor, or hazardous residues. Regulated wastes would be contained and disposed of by a licensed contractor.</p> <p>Long-term impacts would be beneficial due to a reduced consumption rate of chemicals as a result of implementation of the Preferred Alternative. Containers would be recycled or disposed of once considered clean of potential hazardous materials or wastes.</p>	Impacts on or resulting from hazardous materials and wastes would be the same as those described for the Preferred Alternative.	Conditions would remain as described in Section 3.3, <i>Hazardous Materials and Wastes</i> .
Safety	<p>Long-term beneficial impacts on safety, including indoor air quality, installation of fire detection and suppression systems, lighting improvements, and replacement of aging infrastructure.</p> <p>No impacts on runway accident protection zones.</p>	Impacts on safety would be the same as those described for the Preferred Alternative.	Conditions would remain as described in Section 3.4, <i>Safety</i> .
Socioeconomics	<p>Short-term negligible impacts resulting from changes in workloads to work activities; however there would be no gain or loss of personnel. The generation of temporary construction jobs for off-base personnel, and the need for swing shifts or a similar option to maintain cleaning line workload productivity would result in temporary beneficial impacts.</p> <p>No long-term impacts on local socioeconomic conditions.</p>	<p>Potentially significant short-term adverse impacts on B3001 cleaning line personnel during renovation activities if furloughs or layoffs were to occur due to complete shutdown of cleaning line operations.</p> <p>No long-term impacts on local socioeconomic conditions.</p>	Conditions would remain as described in Section 3.5, <i>Socioeconomics</i> .

SUMMARY OF FINDINGS FOR ALTERNATIVES (Continued)

Resource/Issue	Preferred Alternative	Alternative 2	No-Action Alternative
Sustainability	Long-term beneficial impacts on sustainability through reduced energy consumption and increased operational efficiency.	Long-term beneficial impacts on sustainability that would occur sooner than those described for the Preferred Alternative.	Conditions would remain as described in Section 3.6, <i>Sustainability</i> .
Water Resources	<p>Long-term operations of the system would not affect surface water; non-galvanized scrubbers may be installed, which would not impact water quality of runoff. No impacts on wetlands or floodplains.</p> <p>No impacts on groundwater aquifer recharge as there would be no increase in impermeable surfaces.</p> <p>Long-term beneficial impacts on water resources through reduced water consumption and reduced wastewater load to the industrial wastewater treatment plant.</p>	Beneficial impacts on water resources would be the same as those described for the Preferred Alternative but would occur sooner than for the Preferred Alternative.	Conditions would remain as described in Section 3.7, <i>Water Resources</i> .

CUMULATIVE IMPACTS: The EA assessed the cumulative impacts of implementing the Preferred Alternative simultaneously with known current and future projects, and no significant effects were identified. Cumulative air quality impacts are expected to be negligible since all projects would be required to implement BMPs to reduce air emissions below significance thresholds.

With regard to traffic and circulation, short-term impacts on traffic caused by additional construction equipment and construction workers traveling along surrounding roadways could potentially cause a short-term, adverse cumulative impact during peak traffic hours. However, construction activities would not be permanent, and construction equipment would remain on-site, be kept off roads, and would not create an ongoing circulation conflict. Traffic on base could ultimately be improved by the reconfiguration of roadways proposed by other concurrent base projects. Cumulative impacts on transportation and circulation related to construction could be expected to be significant if all projects were to occur simultaneously. If all construction projects were to occur separately, construction-related impacts to transportation and circulation would be temporary and would be expected to be less than significant; overall long-term beneficial impacts would be anticipated due to reconfigured roadways, parking, and gate facilities.

The Preferred Alternative and known and future projects include sustainability goals in order to bring operations in compliance with EO 13514, *Federal Leadership in Environmental, Energy, and Economic Performance*. These goals include improved operational control, energy efficiency, reduction in waste, reduction in annual utility costs, and improved occupational safety. Therefore, cumulative impacts with regard to sustainability are expected to be beneficial.

PERMITS: Implementation of the Preferred Alternative would not require modification of current permits at Tinker AFB.

PUBLIC COMMENTS: A Notice of Availability for public review of the Draft EA was published in *The Oklahoman* and *Tinker Take Off*. The Draft EA was available for public review at the Midwest City Public Library. The public comment period ended on 27 January 2012 and no public comments regarding the EA were received; therefore, no comments were incorporated as part of the Final EA.

DECISION:

I conclude that implementation of the Proposed Action through the Preferred Alternative will not have a significant impact on the natural or human environment. An environmental impact statement is not required for this action. This analysis fulfills the requirements of the NEPA, the President's Council on Environmental Quality, and 32 CFR 989.



STEVEN J. BLEYMAIER, Colonel, USAF
Commander

Date 21 May 12

THIS PAGE INTENTIONALLY LEFT BLANK

FINAL

U.S. AIR FORCE

ENVIRONMENTAL ASSESSMENT

REPLACEMENT OF CHEMICAL CLEANING LINE

TINKER AIR FORCE BASE, OKLAHOMA



United States Air Force

Air Force Materiel Command

Tinker Air Force Base, Oklahoma

February 2012

THIS PAGE INTENTIONALLY LEFT BLANK

FINAL

U.S. AIR FORCE

ENVIRONMENTAL ASSESSMENT

REPLACEMENT OF CHEMICAL CLEANING LINE

TINKER AIR FORCE BASE, OKLAHOMA



Printed on 30% Recycled Paper

February 2012

THIS PAGE INTENTIONALLY LEFT BLANK

TABLE OF CONTENTS

	Page
SECTION 1.0 OVERVIEW	1-1
1.1 Introduction	1-1
1.1.1 Current Chemical Cleaning Line Operations in B3001	1-1
1.1.2 Expected Chemical Cleaning Line Requirements	1-3
1.2 Purpose and Need	1-3
1.3 Location, History and Current Mission	1-4
1.3.1 Tinker Air Force Base	1-4
1.3.2 Building 3001	1-7
1.4 Summary of Environmental Study Requirements	1-7
1.4.1 National Environmental Policy Act	1-7
1.4.2 Scope of the Environmental Assessment	1-8
1.4.3 Interagency and Intergovernmental Coordination for Environmental Planning	1-8
SECTION 2.0 DESCRIPTION OF PROPOSED ACTION AND ALTERNATIVES	2-1
2.1 Introduction	2-1
2.2 Proposed Action	2-1
2.3 Alternatives Selection Criteria	2-2
2.4 Alternatives	2-3
2.4.1 Alternative 1, Preferred Alternative: Phased Replacement of the Chemical Cleaning Line	2-3
2.4.2 Alternative 2: Simultaneous Replacement of all Chemical Cleaning Line Components	2-7
2.4.3 Alternative 3: No-Action Alternative	2-7
2.5 Alternatives Considered but Not Carried Forward	2-7
2.6 Reasonably Foreseeable Concurrent Actions	2-8
2.7 Summary of Potential Impacts	2-8
SECTION 3.0 AFFECTED ENVIRONMENT	3-1
3.1 Air Quality	3-1
3.1.1 Definition of Resource	3-1
3.1.1.1 Criteria Pollutants	3-2

TABLE OF CONTENTS (Continued)

	Page
3.1.1.2 Greenhouse Gases.....	3-5
3.1.1.3 Clean Air Act Amendments	3-5
3.1.1.4 Regulatory Changes.....	3-6
3.1.1.5 Energy and Sustainability	3-7
3.1.1.6 Indoor Air Quality	3-7
3.1.2 Existing Conditions.....	3-8
3.1.2.1 Climate.....	3-8
3.1.2.2 Local Air Quality.....	3-8
3.1.2.3 Tinker AFB.....	3-9
3.1.2.4 Proposed Project Location.....	3-9
3.2 Cultural Resources	3-10
3.2.1 Definition of Resource.....	3-10
3.2.2 Existing Conditions.....	3-11
3.2.2.1 Regional History.....	3-11
3.2.2.2 Tinker AFB.....	3-11
3.2.2.3 Historic Resources at the Proposed Project Locations	3-12
3.3 Hazardous Materials and Wastes	3-13
3.3.1 Definition of Resource.....	3-13
3.3.2 Existing Conditions.....	3-14
3.3.2.1 Hazardous Materials	3-14
3.3.2.2 Hazardous Waste Generation and Accumulation.....	3-16
3.3.2.3 Fuel Storage.....	3-18
3.3.2.4 Groundwater Contamination	3-19
Proposed Action Area	3-21
3.3.2.5 Environmental Restoration Program	3-21
3.4 Safety.....	3-22
3.4.1 Definition of Resource.....	3-22
3.4.2 Existing Conditions.....	3-23
3.4.2.1 Proposed Project Locations	3-23

TABLE OF CONTENTS (Continued)

	Page
3.5 Socioeconomics.....	3-23
3.5.1 Definition of Resource.....	3-23
3.5.2 Existing Conditions.....	3-24
3.5.2.1 Oklahoma City.....	3-24
3.5.2.2 Tinker AFB.....	3-24
3.6 Sustainability	3-25
3.6.1 Definition of Resource.....	3-25
3.6.2 Existing Conditions at the Proposed Project Location	3-25
3.7 Water Resources.....	3-26
3.7.1 Definition of Resource.....	3-26
3.7.2 Existing Conditions.....	3-26
3.7.2.1 Regional Setting	3-26
Wastewater.....	3-28
3.7.3 Existing Conditions at the Proposed Project Location	3-29
SECTION 4.0 ENVIRONMENTAL CONSEQUENCES	4-1
4.1 Air Quality.....	4-1
4.1.1 Approach to Analysis.....	4-1
4.1.2 Impacts.....	4-2
4.1.2.1 Preferred Alternative	4-2
4.1.2.2 Alternative 2: Simultaneous Replacement of All Chemical Cleaning Line Components	4-4
4.1.2.3 Alternative 3: No-Action Alternative	4-5
4.2 Cultural Resources	4-5
4.2.1 Approach to Analysis.....	4-5
4.2.2 Impacts.....	4-6
4.2.2.1 Preferred Alternative	4-6
4.2.2.2 Alternative 2: Simultaneous Replacement of all Chemical Cleaning Line Components	4-6
4.2.2.3 Alternative 3: No-Action Alternative	4-7

TABLE OF CONTENTS (Continued)

	Page
4.3 Hazardous Materials and Wastes	4-7
4.3.1 Approach to Analysis.....	4-7
4.3.2 Impacts.....	4-7
4.3.2.1 Preferred Alternative	4-7
4.3.2.2 Alternative 2: Simultaneous Replacement of all Chemical Cleaning Line Components	4-10
4.3.2.3 Alternative 3: No-Action Alternative	4-10
4.4 Safety.....	4-10
4.4.1 Approach to Analysis.....	4-10
4.4.2 Impacts.....	4-11
4.4.2.1 Preferred Alternative	4-11
4.4.2.2 Alternative 2: Simultaneous Replacement of all Chemical Cleaning Line Components	4-12
4.4.2.3 Alternative 3: No-Action Alternative	4-13
4.5 Socioeconomics.....	4-13
4.5.1 Approach to Analysis.....	4-13
4.5.2 Impacts.....	4-13
4.5.2.1 Preferred Alternative	4-13
4.5.2.2 Alternative 2: Simultaneous Replacement of all Chemical Cleaning Line Components	4-14
4.5.2.3 Alternative 3: No-Action Alternative	4-14
4.6 Sustainability	4-14
4.6.1 Approach to Analysis.....	4-14
4.6.2 Impacts.....	4-14
4.6.2.1 Preferred Alternative	4-14
4.6.2.2 Alternative 2: Simultaneous Replacement of all Chemical Cleaning Line Components	4-15
4.6.2.3 Alternative 3: No-Action Alternative	4-15
4.7 Water Resources.....	4-15
4.7.1 Approach to Analysis.....	4-15

TABLE OF CONTENTS (Continued)

	Page
4.7.2 Impacts	4-16
4.7.2.1 Preferred Alternative	4-16
4.7.2.2 Alternative 2	4-17
4.7.2.3 No-Action Alternative	4-17
SECTION 5.0 CUMULATIVE IMPACTS	5-1
SECTION 6.0 REFERENCES	6-1
SECTION 7.0 LIST OF PREPARERS	7-1

LIST OF TABLES

Table 2-1. Current and Projected Annual Utility Costs	2-2
Table 2-2. Phasing Schedule for Chemical Cleaning Line Renovations	2-3
Table 2-3. Summary of Impacts for Fully Evaluated Resources	2-8
Table 2-4. Summary of No Impact for Resources not Evaluated Further	2-10
Table 3-1. Criteria Pollutant Standards	3-4
Table 3-2. Current Annual Utility Costs	3-26
Table 5-1. Projects Occurring at or near Tinker AFB	5-1

LIST OF FIGURES

Figure 1-1. Regional Location Map	1-5
Figure 1-2. Current Tinker AFB Layout Map	1-6
Figure 2-1. Alternative Site Locations	2-4
Figure 3-1. Hazardous Materials and Wastes	3-15
Figure 3-2. Environmental Restoration Program Sites	3-20

THIS PAGE INTENTIONALLY LEFT BLANK

LIST OF ACRONYMS

§	section
°F	degrees Fahrenheit
ACOG	Association of Central Oklahoma Governments
ACW	Air Control Wing
AFB	Air Force Base
AFI	Air Force Instruction
AGE	aerospace ground equipment
AP	accumulation point
APZ	Accident Potential Zone
AST	aboveground storage tank
AT/FP	antiterrorism/force protection
B	Building
BMP	best management practice
Btu	British thermal unit
CAA	Clean Air Act
CAAA	Clean Air Act Amendments
CEQ	Council on Environmental Quality
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFC	chlorofluorocarbon
CFR	Code of Federal Regulations
CH ₄	methane
CO	carbon monoxide
CO ₂	carbon dioxide
CO _{2e}	equivalent carbon dioxide
CRP	Compliance Restoration Program
CSP	central steam plant
CZ	Clear Zone
DEQ	Oklahoma Department of Environmental Quality
DoD	Department of Defense
EA	Environmental Assessment
EIS	Environmental Impact Statement
EO	Executive Order
EPA	United States Environmental Protection Agency
ERP	Environmental Restoration Program
FY	fiscal year
GHG	greenhouse gas
GWMU	groundwater management unit
HAP	hazardous air pollutant
HCFC	hydrochlorofluorocarbon
HFC	hydrofluorocarbon
HMMP	Hazardous Materials Management Program
HMMS	Hazardous Material Management System

LIST OF ACRONYMS (Continued)

HWSF	hazardous waste storage facility
IAP	initial accumulation point
ICRMP	Integrated Cultural Resources Management Plan
IICEP	Interagency and Intergovernmental Coordination for Environmental Planning
IRP	Installation Restoration Program
IWTP	industrial wastewater treatment plant
JP	jet propellant
kWh	kilowatt-hour
LEED	Leadership in Energy and Environmental Design
MGal	million gallons
MILCON	military construction
Mlbs	million pounds
MLRA	major land resource area
MMRP	Military Munitions Response Program
MSDS	Material Safety Data Sheet
N ₂ O	nitrous oxide
NAAQS	National Ambient Air Quality Standards
NEPA	National Environmental Policy Act
NESHAP	National Emission Standards for Hazardous Air Pollutants
NHPA	National Historic Preservation Act
NO ₂	nitrogen dioxide
NPL	National Priorities List
NRHP	National Register of Historic Places
OC-ALC	Oklahoma City Air Logistics Center
OCC	Oklahoma Corporation Commission
OSS	Operations Support Squadron
PCE	perchloroethene
PFC	perfluorocarbon
PLC	programmable logic controller
PM ₁₀	particulate matter equal to or less than 10 microns in diameter
PM _{2.5}	particulate matter equal to or less than 2.5 microns in diameter
PSD	Prevention of Significant Deterioration
RCRA	Resource Conservation and Recovery Act
SE	southeast
sf	square feet
SF ₆	sulfur hexafluoride
SIP	State Implementation Plan
SO ₂	sulfur dioxide
SWPPP	Storm Water Pollution Prevention Plan
TACX	Tinker Aerospace Complex
TCE	trichloroethene
Ton AC	tons of air conditioning
tpy	tons per year

LIST OF ACRONYMS (Continued)

TSDf	treatment, storage, or disposal facility
UFC	Unified Facilities Criteria
U.S.	United Statesla
USAF	United States Air Force
USC	United States Code
UST	underground storage tank

THIS PAGE INTENTIONALLY LEFT BLANK

SECTION 1.0 OVERVIEW

1.1 Introduction

As part of the aviation operations at Tinker Air Force Base (AFB), maintenance of base-assigned aircraft is a routine function of daily aviation operations. Aircraft maintenance includes a variety of routine inspections, servicing, and repairs. Dirt and grease buildup on internal components can affect component performance and in some situations render an aircraft nonoperational. As such, aircraft maintenance and repair operations include cleaning an aircraft's internal components to remove dirt and grease buildup as well as removing paint. At Tinker AFB, the comprehensive cleaning of aircraft components is conducted through a chemical cleaning line process in Building 3001 (B3001); the Blade Building (B3221) also has cleaning line facilities.

1.1.1 Current Chemical Cleaning Line Operations in B3001

Process. Currently, the Central Engine Cleaning Line (cleaning line) in B3001 is used to clean most aircraft engine parts for aircraft assigned to Tinker AFB. Disassembled aircraft engine parts are brought to the cleaning line in a ready-for-cleaning state. Cleaning line personnel inventory each incoming part for tracking purposes prior to cleaning. The parts are then taken by personnel to a loading area and placed in carrier baskets. The cleaning line uses a computerized control system (in a separate control room) for process monitoring and uses a monorail to transport carrier baskets to various chemical and water rinse baths (process tanks) to either clean the parts or strip the parts of paint. The monorail system conveys the carrier baskets between tanks as needed, dipping and raising baskets from the tanks according to the chemical process. Each engine part has a specific requirement and process protocol for cleaning; cleaning line personnel program the chemical cleaning process specific to each part into the control system prior to cleaning. Once programmed, the automated control system directs the monorail to appropriate process tanks in a predetermined sequence. The monorail transports the carrier baskets to assigned process tanks where baskets are submerged for a defined period of time, repeating the process as necessary through chemical baths and water rinses. Following the cleaning or paint-stripping process, the monorail transports the carrier baskets to a drying area where the cleaning line personnel verify each part previously inventoried is present and accounted for and prepare the parts to be returned to the appropriate facility on Tinker AFB.

Process Configuration. The existing cleaning line system is housed in an open shop area of approximately 20,000 square feet (sf) within B3001. The existing cleaning line consists of six process lines, with a total of 65 tanks that comprise the chemical baths and water rinse tanks required to accommodate the various types of cleaning activities. Currently, one of the process lines has been abandoned and taken offline. The tanks are set up in six rows—one for each process line—along which the overhead monorail transports carrier baskets between tanks. Each tank is filled with a chemical solution (e.g., alkaline rust and scale remover, alkaline paint stripper) or a water rinse. The tanks are situated on concrete pedestals or piers to elevate the

tanks above the concrete floor of B3001. Currently, the tanks are refilled with chemical solution several times per day or are constantly refilled with water, resulting in steady overflow of tank contents onto the floor of the cleaning line work area. The overflow generated by the tanks drains along the floor into trenches between each row of tanks. Heavy buildup of materials such as mineral and chemical deposits occurs on the tank sides and floor of the overflow area. The overflow solutions ultimately drain into the utility trench in the northwestern corner of the cleaning line work area, where the runoff is conveyed to the Tinker AFB industrial wastewater treatment plant.

Ancillary Infrastructure. A metal catwalk with side railing is installed between the rows of tanks to provide an elevated surface above ground level so personnel can access the tanks. The metal catwalk is placed to avoid direct contact with tank overflow materials and to prevent personnel from accidentally contacting the tank overflow on the floor. The cleaning line is outfitted with several exhaust fans and ventilation ducts, some of which are equipped with fume scrubbers to remove potential chemical wastes from the emitted steam and exhaust air generated by the cleaning line.

Small-Parts Cleaning. A separate cleaning line for small aircraft parts is adjacent to the primary cleaning line system described above. The small-parts cleaning line was designed to accommodate parts too small to be contained by the wire mesh of the carrier baskets connected to the monorail system. The small-parts cleaning line consists of eight smaller tanks and is not served by the monorail system. Upgrades (e.g., replacement of components) of the small-parts cleaning line are currently under way. Located between the small-parts line cleaning line and the primary cleaning line system are several abandoned underground chemical collection tanks. These tanks were abandoned sometime between 1990 and 2000; the chemical composition of the contents within the tanks is unknown but is suspected to present a hazardous waste concern. A metal catwalk has been installed above these abandoned collection tanks to prevent access to this area. Due to concerns regarding the suspected hazardous contents of the tanks, two stairwells to the abandoned collection tank area have been blocked to prevent access.

System Shortcomings. The existing cleaning line is approximately 30 years old and exhibits the following inefficiencies inherent to the design and age of the system:

- The existing system does not provide any process control over tank conditions (i.e., chemistry or temperature of tank contents), forcing the cleaning line personnel to routinely check and make manual adjustments to the tank conditions.
- The existing chemical tanks are not equipped with agitation or filtration devices; such devices would provide increased cleaning efficiency and longer chemical activity of the bath contents.
- Water rinse tanks do not filter or recycle rinse water, resulting in excessive water use by the overall system.
- A constant overflow system is used to continuously flush the rinse bath tanks, resulting in a large industrial wastewater stream.

- Some tanks are heated depending on the chemical process within the tanks; however, the design of the heating coils on these tanks results in inefficient heating of the tanks.
- The tanks are not covered, which reduces the tank's ability to maintain a constant temperature and contributes to steam and vapor emissions from the cleaning line system.
- No tanks on the cleaning line are of adequate size to accommodate larger aircraft engine parts (e.g., F117, PW4062). The cleaning line must be sized to accommodate parts from these engines, as OC-ALC has been designated as a source of repair for these engines. Apart from the abandoned collection tanks, safety is an issue due to the aging infrastructure of the cleaning line system. The overhead monorail system has experienced failures in the past and has resulted in dropped carrier baskets, presenting potential hazards to personnel.
- The tanks, overflow area, and utility trench may present potential human health hazards from contact with chemical materials because tanks are not covered and are near the access catwalk. The railing on the catwalk does not fully prevent a person from falling through and into the utility trench area.

1.1.2 Expected Chemical Cleaning Line Requirements

Replacement of the existing cleaning line has been proposed to enable an effective, streamlined, and efficient cleaning process for the sustained workload of aircraft engine part maintenance received from aviation facilities on Tinker AFB. As aircraft maintenance and modification workloads change, the cleaning line requirements will change. Specifically, larger engine parts from the F117 and PW4062 will be cleaned at Tinker AFB, and the new cleaning line with larger tanks is necessary to accommodate those parts. Replacement of the existing cleaning line would provide a more energy-efficient operation that would reduce water and chemical use, generate cost savings for overall cleaning line system operations, and accommodate larger engine parts.

1.2 Purpose and Need

The *purpose* of the Proposed Action is to provide an improved cleaning line system to accommodate current and expected workload in a manner that provides better system control, energy efficiency, and improved safety. The new system would greatly reduce energy and resource (e.g., water, chemicals) consumption. Tank controls and system monitors would be included in the proposed improvements to the cleaning line, further reducing chemical and energy waste.

The *need* for the Proposed Action is that the existing system is outdated, inefficient, and at times unsafe to personnel and the environment, which contributes to the inefficient and unsafe manner in which current cleaning operations are conducted. The existing cleaning line:

- Does not provide any process control over tank conditions
- Is not equipped with agitation or filtration devices
- Does not utilize filtration or recycling of rinse water
- Employs a wasteful constant overflow system
- Has uncovered tanks that contribute to inefficient heating and steam/vapor emissions
- Is inadequately sized to accommodate larger aircraft engine parts, which will contribute to expected cleaning line workload
- Has an aging infrastructure that presents safety concerns
- Has a configuration that presents human health hazards from overflow chemicals

1.3 Location, History and Current Mission

1.3.1 Tinker Air Force Base

Tinker AFB is within the city limits of Oklahoma City, 5 miles east of downtown (Figure 1-1). The main portion of the base is bordered by Interstate 40, Southeast (SE) 15th Street, and SE 29th Street on the north; Douglas Boulevard and Post Road on the east; I-240 on the south; and Sooner Road on the west (Figure 1-2). Midwest City and Del City are north and northwest of Tinker AFB, respectively.

Tinker AFB's largest organization is the Oklahoma City Air Logistics Center (OC-ALC). The OC-ALC is the largest of three air logistics centers in the United States Air Force (USAF) Materiel Command and provides depot maintenance, product support, services and supply chain management, and information support for 31 weapon systems, 10 commands, 93 USAF bases, and 46 foreign nations. The OC-ALC is the worldwide manager for a wide range of aircraft, engines, missiles, software, and avionics and accessories components. Aircraft serviced and maintained at Tinker AFB include the E-3, C/KC/EC-135, B-1, B-2, B-52, C-130, E-6, and engines for those aircraft as well as the engines for the E-8, F-15, F-16, and F/A-22 aircraft.

Currently, Tinker AFB encompasses approximately 5,460 acres and contains an airfield and other facilities that support various associated units at the base (Figure 1-2) (Tinker AFB 2006). Tinker AFB provides specialized logistics support, management, maintenance, and distribution to defense weapons systems worldwide. Tinker AFB is divided into seven districts, each with specific land uses. The 72d Air Base Wing is the host command. Associated units at the base include the OC-ALC, the 552d Air Control Wing, the 507th Air Refueling Wing, the United States (U.S.) Navy Command Strategic Communications Wing One, the 3d Combat Communications Group, and the 38th Cyberspace Engineering Group. Approximately 27,000 personnel, plus additional visitors, access the base each day.

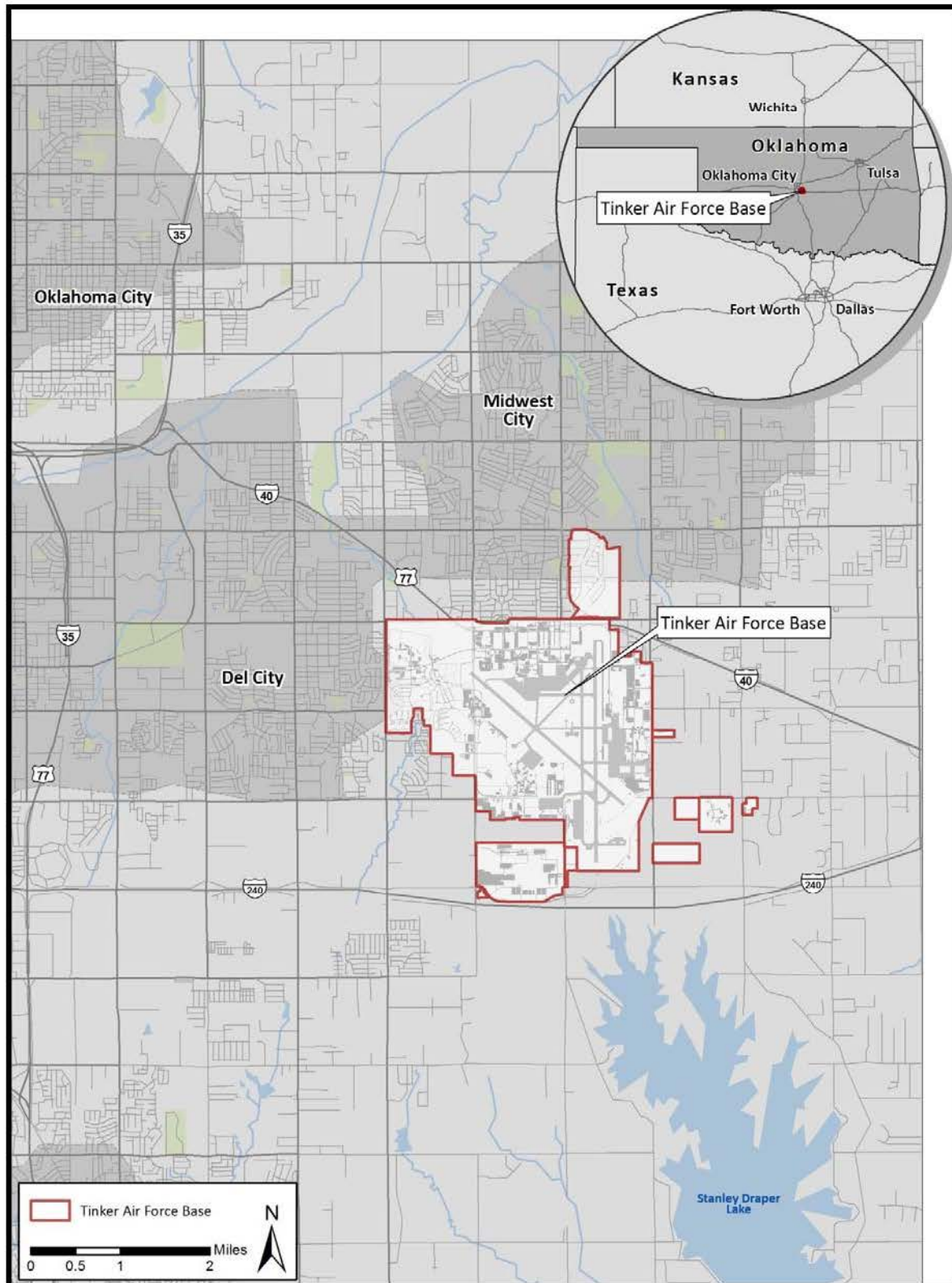


Figure 1-1. Regional Location Map

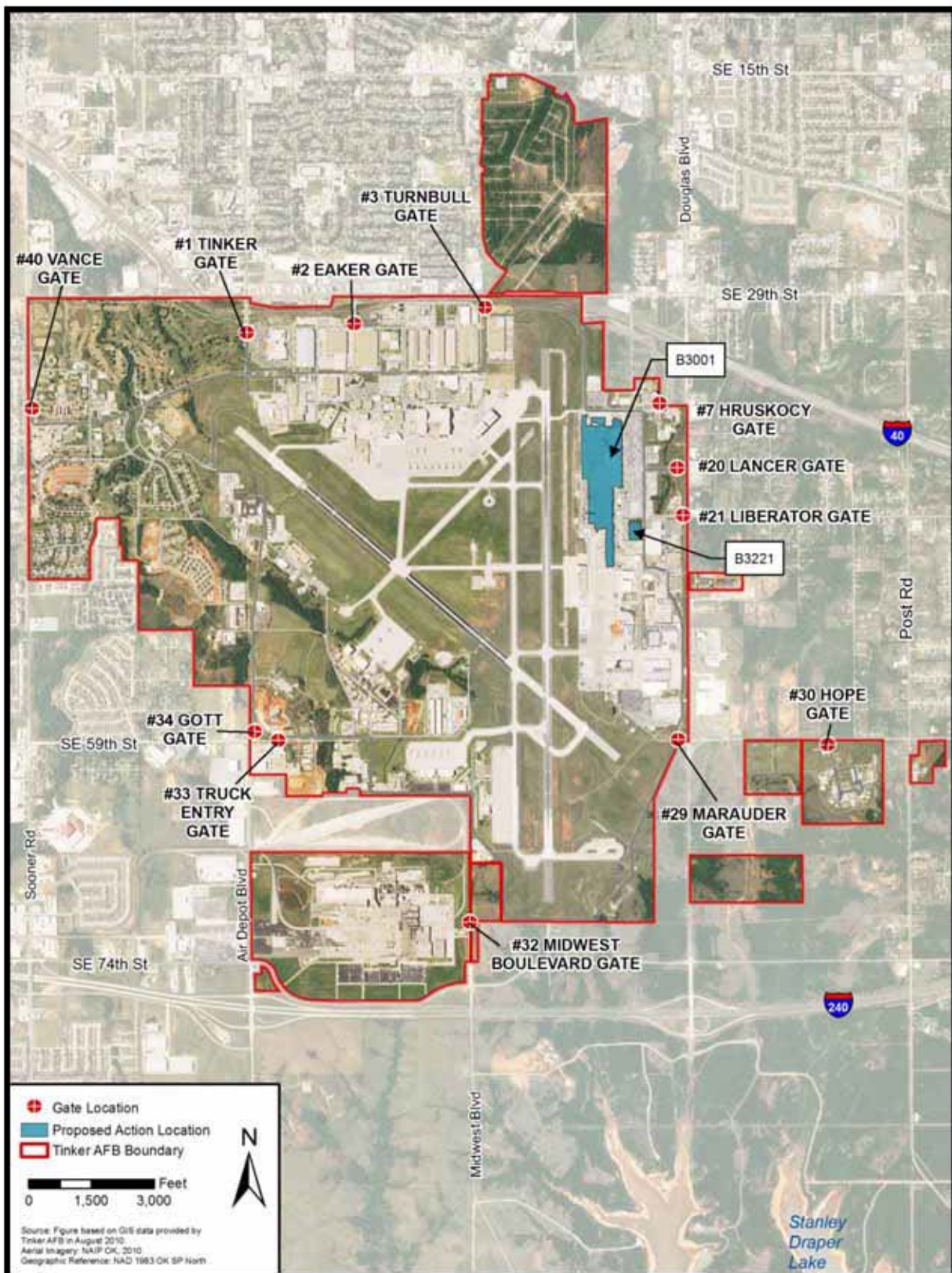


Figure 1-2. Current Tinker AFB Layout Map

1.3.2 Building 3001

The cleaning line is in B3001 on the eastern portion of Tinker AFB (Figure 1-2). B3001 was originally constructed in 1943 and covers approximately 2,196,611 sf (50 acres); the cleaning line was installed in B3001 in 1978. A fire in 1984 burned most of the building, requiring most of the interior of B3001 to be refurbished. The OC-ALC, which employs more than 16,000 civilians and military personnel, is headquartered in B3001. B3001 also houses facilities for the 76th Maintenance Wing, which employs more than 7,400 military and civilian professionals, to conduct overhaul, repair, and test activities for aircraft fuel control accessories. Aircraft engine parts from throughout Tinker AFB and occasionally other USAF bases are brought to the cleaning line in B3001.

1.4 Summary of Environmental Study Requirements

This Environmental Assessment (EA) addresses the potential impacts of the Proposed Action on the human and natural environment as required by the National Environmental Policy Act (NEPA) of 1969, as amended (Title 42, United States Code Sections 4321 through 4347 [42 USC §4321-4347]), and in accordance with the Council on Environmental Quality (CEQ) regulations implementing the procedural provisions of NEPA (Title 40, Code of Federal Regulations Parts 1500-1508 [40 CFR 1500-1508]) and 32 CFR 989.

1.4.1 National Environmental Policy Act

NEPA requires that federal agencies consider potential environmental consequences of proposed actions. The law's intent is to protect, restore, or enhance the environment through well-informed federal decisions. The CEQ was established under NEPA for the purpose of implementing and overseeing federal policies as they relate to this process. In 1978, the CEQ issued *Regulations for Implementing the Procedural Provisions of the National Environmental Policy Act* (40 CFR 1500-1508 [CEQ 1978]). The Air Force developed its own procedural regulations for implementing NEPA which are codified at 32 CFR 989. These regulations specify that an EA be prepared to accomplish the following:

- Briefly provide sufficient analysis and evidence for determining whether to prepare an Environmental Impact Statement (EIS) or a Finding of No Significant Impact
- Aid in an agency's compliance with NEPA when no EIS is necessary
- Facilitate preparation of an EIS when one is necessary

Further, to comply with other relevant environmental requirements (e.g., Executive Orders [EOs], resource-specific statutes, and regulations) and to assess potential environmental impacts, the decision-making process for a proposed action involves a thorough examination of all environmental issues pertinent to the action. The decision-making process includes a study of environmental issues related to the proposed chemical cleaning line replacement at Tinker AFB.

1.4.2 Scope of the Environmental Assessment

This EA will address the full breadth of potential environmental, cultural, and socioeconomic impacts associated with the Proposed Action. The geographic area addressed will include the Proposed Action site and immediately surrounding environs. In addition to the Proposed Action, the EA will assess potential impacts associated with reasonable alternatives to the Proposed Action and actions associated with the Proposed Action.

Resources analyzed will include the standard required Critical Elements of the Human Environment, as defined by NEPA, as well as additional issues identified by Tinker AFB staff and the USAF. The scope of analyses is based on the requirements of CEQ and the additional resources identified by Tinker AFB staff.

1.4.3 Interagency and Intergovernmental Coordination for Environmental Planning

Public involvement is a useful component of the EA process; it includes both agencies and members of the public. Public involvement occurs primarily during the public comment period. Interagency and Intergovernmental Coordination for Environmental Planning (IICEP) is a federally mandated process for informing and coordinating with other governmental agencies regarding proposed actions. As detailed in 40 CFR 1501.4(b), CEQ regulations require intergovernmental notifications prior to making any detailed statement of environmental impacts. Through the IICEP process (per AFI 32-7060, *Interagency and Intergovernmental Coordination for Environmental Planning*), the USAF notifies relevant federal, state and local agencies and allows them sufficient time to make known their environmental concerns specific to a proposed action (See Appendix A). Comments and concerns submitted by these agencies during the IICEP process are subsequently incorporated into the analysis of potential environmental impacts conducted as part of the EA. No agency comments on the environmental analysis of the Proposed Action were received.

For the Proposed Action under consideration, a draft EA was issued, the document was sent directly to identified agencies, a notice of availability was published in *The Oklahoman* and *Tinker Take Off*, and copies of the draft EA were placed at the Midwest City Library (see Appendix A). Upon publication of the notice of availability and placement of the EA in the public library, the 15-day public comment period was commenced. During the public comment period, all interested individuals were able to request to view a copy of the draft EA at the selected library and were able to submit written comments. No public comments on the environmental analysis of the Proposed Action were received.

SECTION 2.0 DESCRIPTION OF PROPOSED ACTION AND ALTERNATIVES

2.1 Introduction

Due to the changing workload for engine testing and aircraft modifications at Tinker AFB, the cleaning line will experience a different workload that will include larger aircraft engine parts than are included in current workload. However, the existing cleaning line does not provide process control, is configured in such a way that excessive resources are used during operations, cannot accommodate larger aircraft engine parts, and presents human health hazards from overflow chemicals. Therefore, improved system functionality is needed to address process deficiencies, excessive resource use, unnecessarily high levels of maintenance, safety issues, and aging infrastructure, as well as to accommodate the anticipated changes in aircraft engine parts through the cleaning line. Additionally, the USAF is required to follow EO 13514, *Federal Leadership in Environmental, Energy, and Economic Performance*. The current cleaning line uses an overly great amount of energy, water, and chemical resources, which makes it an inefficient system that is not compliant with EO 13514. An initial review of an improved cleaning system has shown that replacing the existing cleaning line will likely reduce operational costs. The Proposed Action would assist Tinker AFB and the USAF in aligning with federal goals and regulations pertaining to sustainable energy use and development. As required by NEPA, the potential impacts of the Proposed Action on the human and natural environment must be evaluated, and reasonable alternatives to the Proposed Action must be considered.

2.2 Proposed Action

The Proposed Action is to renovate and improve the existing cleaning line system in B3001 at Tinker AFB by providing improved system monitors and controls, reducing the overall energy consumption of the system, and enabling the system to accommodate larger engine parts. The existing cleaning line incurs approximately \$3 million per year in utility costs; it is estimated that the proposed improvements would save approximately \$2.76 million in annual utility costs (Tinker AFB 2010a). Current and projected annual utility costs are summarized in Table 2-1.

Implementation of the Proposed Action would provide an aircraft engine cleaning line capable of accommodating current and programmed workload in a manner that provides better system control, energy efficiency, and improved occupational safety. The Proposed Action would also enable the cleaning line to accommodate the larger engine parts (e.g., engines from aircraft such as C-17, KC-46A) that will need to be processed due to anticipated changes in flight and maintenance operations at Tinker AFB. The proposed system improvements would enable the system to accommodate all existing workload and programmed workload in a manner that is more energy efficient, easier to operate, and safer. No increase in workload would occur as part of the Proposed Action; however, implementation of the Proposed Action would enable the cleaning line to accommodate current and projected increased workload due to the improved efficiency of the system. Therefore, the Proposed Action would not require additional personnel

for operation of the cleaning line, but workload may fluctuate and would be determined by other aircraft flight and maintenance operations at Tinker AFB.

Table 2-1. Current and Projected Annual Utility Costs

Description	Unit	Usage (Current)	Cost in \$ (Current)	Usage (Projected)*	Cost in \$ (Projected)*	Projected Savings*
Blowers	kWh	666,566	33,328	66,657	3,333	29,995
Exhaust Fans	kWh	1,045,594	52,280	418,238	20,912	31,368
Building Heating	Mlbs	23,621	136,055	9,449	54,422	81,633
Process Heating	Mlbs	26,781	154,257	10,713	61,703	92,554
Building Cooling	Ton AC	460,689	9,674	184,276	3,869	5,805
Condensate	kGal	4,721	71,287	0	0	71,287
Water	kGal	160,396	130,883	6,416	5,185	125,648
Industrial Wastewater	kGal	160,396	2,421,974	6,416	96,879	2,325,068
Total			\$3,009,688		\$246,303	\$2,763,385

Source: Carried over from Tinker AFB 2010b

Notes: Ton AC = tons of air conditioning (12,000 British thermal units [Btu] per hour or 3.517 kilowatt-hours), kWh = kilowatt-hours, kGal=1,000 gallons, Mlbs = 1,000,000 pounds

* These values are estimated

Replacement of the cleaning line would benefit operational efficiency while reducing energy and resource waste, saving approximately \$2.76 million annually in utility costs. The new cleaning line would also provide operational flexibility to accommodate larger aircraft engine parts.

2.3 Alternatives Selection Criteria

The range of reasonable alternatives considered in this Description of Proposed Action and Alternatives is limited to those alternatives that would satisfy the purpose of and need for the Proposed Action as described in Section 1.2. The current cleaning line system does not have the capacity to accommodate the larger engine parts that will constitute the line's expected workload, does not provide process control, contributes to excessive resource use, requires unnecessary levels of maintenance, exhibits safety concerns, and contains aging infrastructure. Reasonable alternatives would fulfill the goal of providing an improved, energy-efficient system with the operational flexibility to accommodate the cleaning requirements of current and anticipated aircraft engine parts. The range of reasonable alternatives must also meet essential technical, engineering, and economic threshold requirements to ensure that each alternative is environmentally sound, economically viable, and compliant with governing standards and regulations.

2.4 Alternatives

Alternative project approaches to implement the Proposed Action were identified and evaluated. Three alternatives were identified, including the No-Action Alternative (which is a required alternative under NEPA). Each alternative's adequacy for satisfying the project's objectives was evaluated, and a summary of those evaluations is provided in the following sections.

2.4.1 Alternative 1, Preferred Alternative: Phased Replacement of the Chemical Cleaning Line

Under Alternative 1, the Preferred Alternative, replacement of the cleaning line in B3001 would be implemented in phases (Tinker AFB 2010b). The location of B3001 is shown in Figure 2-1. A phased approach throughout all renovation activities would allow for the cleaning line to remain partially in operation during construction activities and would minimize impacts on workload capacity during renovations. A phased approach would also reduce the funding requirements for any given year by distributing the cost over several years. A preliminary phase of the project included building a new small-parts cleaning line and a reverse-osmosis water treatment system; that effort is currently under way. Phasing of the cleaning line renovations for fiscal year 2012 (FY12) through FY13 is provided below in Table 2-2.

Table 2-2. Phasing Schedule for Chemical Cleaning Line Renovations

Year	Description
FY12	Repair current control system, demolish process lines 4-6, build one new process line and a control system right-sized for final shop design
FY13	Build two new process lines and demolish existing lines 1-3 after completion.

Source: Tinker AFB 2010b

FY 12. Renovations scheduled for FY12 would repair the current control system with a programmable logic controller (PLC). The new PLC controller and associated equipment, remote input/output blocks, proximity sensors, and communication sensors would replace the outdated control hardware and software currently used. This would enable the cleaning shop to work more effectively as well as have a system that is more reliable and easier to maintain. During these renovation activities, production along the cleaning line would continue to accommodate workload; at least one process line capable of accommodating long processes and multistep alkaline cleaning would remain operational at any given time. However, parts requiring paint stripping would be redirected to B3221, located to the east of B3001, towards the southern end of B3001, south of 44th Street (Figure 2-1).

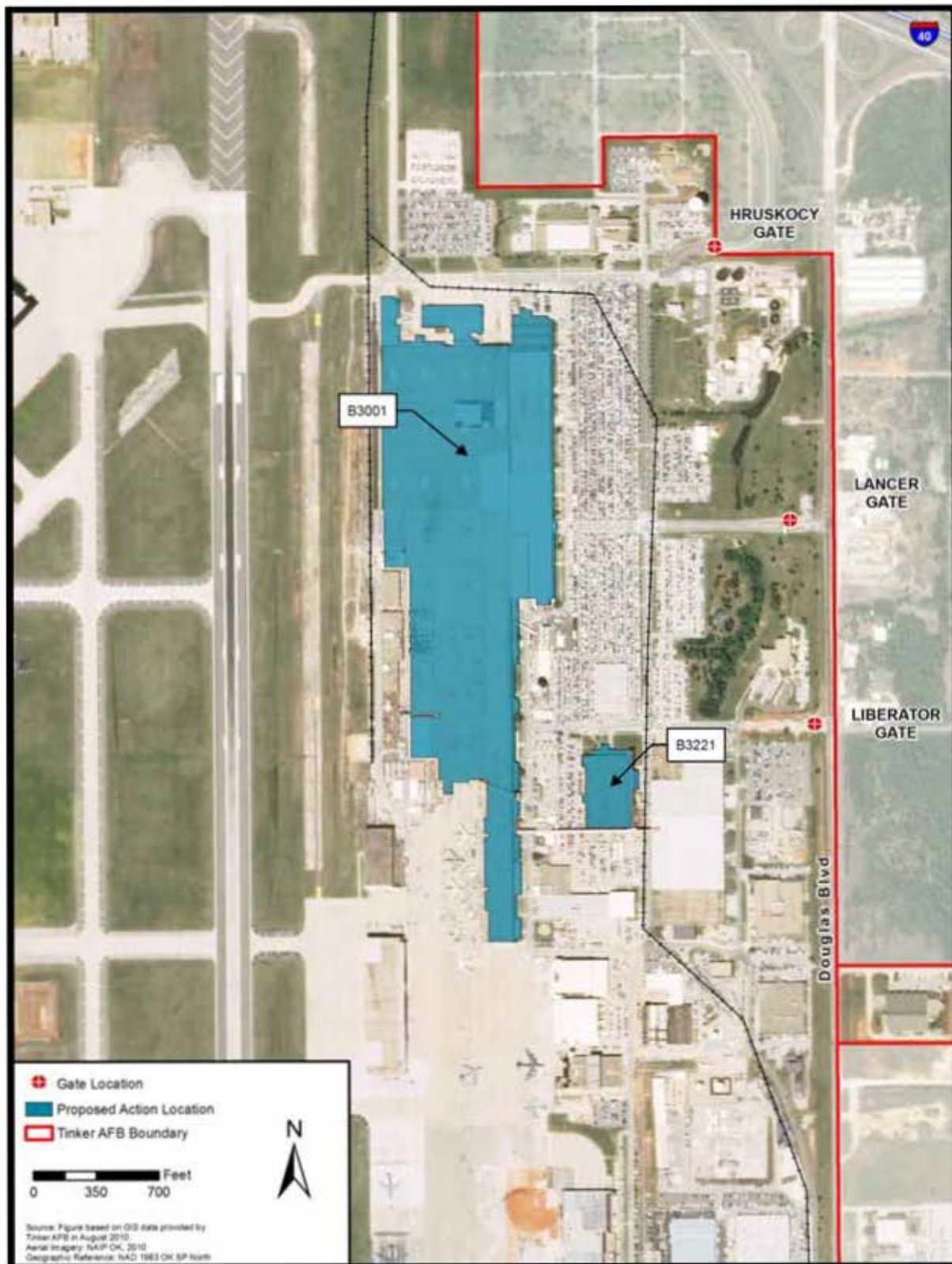


Figure 2-1. Alternative Site Locations

B3221 has existing facilities capable of accommodating a portion of the redirected existing cleaning line workload for paint removal operations.

Renovations proposed for FY12 would also include developing the configuration of the new chemical and rinse tank layout, designing the remote system control model for working tanks, demolishing process lines 4 – 6, and building one new process line in the open area.

- Replacement of process tanks
- Refurbishment/restoration of concrete tank piers and laying new piers as necessary
- Installation of cleaning line sensors and controls
- Installation of heating loops
- Installation of water recycling loops
- Installation of new transport system designed for the new line
- Control system design and installed sized for final shop design
- Installation of necessary ventilation and make up air units
- Installation of 1 hour fire rated enclosure

The system would be designed towards a final product similar to the automatic cleaning line in B3001. The new line would contain 12 to 14 tanks, and the transport system would be a gantry style hoist system that is non-dedicated and allows tanks and baskets to be bypassed. Production would continue on process lines 1, 2 and 3 along with the automatic cleaning line for the short, one step cleaning processes. Paint stripping capability would be moved to process line 2. B3221 facilities would be used as needed, dependent on workload. An equipment platform to house fume scrubbers and makeup air units would be installed on the roof of B3001 as part of this project phase. The Preferred Alternative may require four fume scrubber/fan assemblies that are each approximately 24 feet in length, 12 feet in width, and 9 feet 8 inches in height. If it is determined that new fume scrubbers would be required for the proposed project, the existing fume scrubbers would be replaced with new fume ones. Externally exposed portions of the new scrubbers would be constructed of non-galvanized materials.

FY 13. Installation of two new process lines is scheduled to occur in FY13 and would use the same control system developed in the FY12 portion of the project. One of the new lines would be a mirror image of the line built in FY12, capable of performing all steel cleaning processes. The other line would have a short process line designed for paint stripping and is planned to contain 3 larger tanks designed to accommodate larger engine parts.

Associated Renovation Activities. The Preferred Alternative would include the removal of piping, chemical tanks, insulation, and floor deposits and residues; some of these materials may be hazardous materials and would require proper handling and disposal. Personnel shifts may be altered during renovation activities to include a swing shift to accommodate workload.

To meet International Building Code use and occupancy requirements, various fire suppression and detection measures would be incorporated as part of the Preferred Alternative (Tinker AFB 2010b):

- One-hour fire-rated enclosures for the automated cleaning line system and the small parts cleaning line
- One-hour fire rating on the structure enclosing the control room facility
- Water curtains for the load/unload stations of the automated cleaning line (per National Fire Protection Association Code 13, *Standard for the Installation of Sprinkler Systems*)
- Independent fire protection and fire detection systems and lighting installed in control room facility
- Independent fire protection and fire detection systems and lighting in electrical equipment space

Resultant System Improvements. Numerous process and resource improvements would be achieved through implementation of the Preferred Alternative. The proposed renovations would accomplish the following:

- Reduction of total cleaning lines from six to three.
- Provide cleaning line operators with immediate feedback on tank conditions
- Enable operators to control the chemical processes and tank conditions as needed
- Expand cleaning line capacity to accommodate large aircraft engine parts that cannot currently be accommodated
- Install new hardware in tanks to provide agitation and filtration of the tank contents, resulting in increased cleaning efficiency and chemical bath life
- Result in resource improvements, including reduced water usage due to increased operator control over tank conditions
- Result in reduced exhaust ventilation through the provision of tank covers, exhaust air scrubbers, and air recyclers, reducing the loss of air-conditioned air from B3001
- Result in decreased steam usage by incorporating fluid into heat tanks instead of steam, as is currently configured
- Provide a reduction in utility costs from approximately \$3 million per year to approximately \$0.25 million per year, as presented in Section 2.2, *Proposed Action*

A phased approach throughout all renovation activities would allow for the cleaning line to remain partially in operation during construction activities and would minimize impacts on workload capacity during the renovations; there are no other facilities on Tinker AFB with existing capacity to accommodate the current cleaning line workload. Overall, implementation of the Preferred Alternative would result in a more energy-efficient cleaning line with the capacity and flexibility to accommodate current and expected workload.

2.4.2 Alternative 2: Simultaneous Replacement of all Chemical Cleaning Line Components

Under Alternative 2, all cleaning line components would be replaced simultaneously. Alternative 2 would require complete shutdown of the cleaning line in B3001 and redirection of the workload to B3221 until replacement of the cleaning line is complete (Figure 2-1). B3221 has existing facilities that can accommodate a portion of the current cleaning line workload. Implementation of Alternative 2 could be implemented within one or two years, which would allow for faster replacement of the cleaning line due to complete shutdown; however, the B3221 does not have capacity to accommodate the entire current cleaning line workload.

Similar to the Preferred Alternative, Alternative 2 would generate exposure of hazardous materials (e.g., chemical residues) during renovation efforts. As with the Preferred Alternative, Alternative 2 would provide an updated cleaning line system that would conserve approximately \$2.76 million in utility costs per year. Under Alternative 2, more funding would be required per year due to the nonphased approach and shorter construction duration. Implementation of Alternative 2 would also result in a more energy-efficient cleaning line than currently exists with the capacity and flexibility to accommodate current and expected workload.

2.4.3 Alternative 3: No-Action Alternative

Under the No-Action Alternative, Tinker AFB would not implement the Proposed Action, and the cleaning line in B3001 would not be improved or renovated to streamline the operational flow, improve safety, or better accommodate current and expected workload.

Although this alternative would not fulfill the purpose and need of the Proposed Action, it will be carried forward as required by the CEQ. CEQ's regulations for the implementation of NEPA stipulate that the No-Action Alternative must be considered to assess environmental consequences that may occur if the Proposed Action is not implemented.

2.5 Alternatives Considered but Not Carried Forward

Two additional alternatives were identified but eliminated from further consideration. One such alternative entails permanently relocating all cleaning line operations to B3221. However, B3221 does not have sufficient capacity to handle the entire current workload and would not accommodate expected workload.

Another alternative identified but eliminated from further consideration was the construction of a new cleaning line at an alternative location in B3001. This alternative would require the relocation of existing support equipment to provide adequate space for the cleaning line, as well as the installation of additional infrastructure to support the cleaning line. The cost estimate for construction at an alternate location in B3001 was substantially higher than the existing cleaning line location; therefore this alternative was not considered to be feasible.

2.6 Reasonably Foreseeable Concurrent Actions

Implementation of the Proposed Action and associated potential environmental impacts would occur concurrently with other projects and developments proposed on Tinker AFB in the vicinity of the cleaning line. In addition to the Proposed Action, other projects that may occur or are planned on Tinker AFB within the next three years include the following:

- B3108 Demolition
- Air Traffic Control Tower Construction
- T9 Test Cell Construction at Tinker Aerospace Complex (TACX)
- Steam Plant Decentralization
- MROTC Lease
- Henry Twaddle Facility Acquisition
- B3001 Renovation
- TACX Acquisition

2.7 Summary of Potential Impacts

Potential impacts are evaluated and described in Section 4, *Environmental Consequences*. Table 2-3 provides a summary of the potential impacts for resource areas fully evaluated and associated with the Preferred Alternative, Alternative 2, or the No-Action Alternative.

Table 2-3. Summary of Impacts for Fully Evaluated Resources

Resource/Issue	Preferred Alternative	Alternative 2	No-Action Alternative
Air Quality	<p>No ground-disturbing activities would occur. Temporary (short-term) negligible construction emissions (i.e., construction dust) generated during renovation activities in B3001.</p> <p>Temporary combustion emissions from vehicles and equipment used during renovation activities in B3001.</p> <p>Greenhouse gas emissions resulting from construction-related vehicles would result in minimal impacts.</p> <p>Long-term beneficial impacts on operational emissions from installation of energy-efficient utilities.</p> <p>Long-term beneficial impacts on indoor air quality from installation of a new, improved cleaning line ventilation system.</p>	<p>Long-term beneficial impacts would be the same as those described for the Preferred Alternative; however, the beneficial impacts would occur sooner than under implementation of the Preferred Alternative due to a compressed work schedule (non-phased approach).</p> <p>Temporary impacts would be similar to those described for the Preferred Alternative; however, proposed construction activities would occur over a shorter time period.</p>	<p>Conditions would remain as described in Section 3.1, <i>Air Quality</i>.</p>

Table 2-3. Summary of Impacts for Fully Evaluated Resources (Continued)

Resource/Issue	Preferred Alternative	Alternative 2	No-Action Alternative
Cultural Resources	No adverse effect on cultural resources would occur. There would be no significant change in the character-defining features of B3001 and no impacts on visual aesthetics.	Impacts on cultural resources would be the same as those described for the Preferred Alternative.	Conditions would remain as described in Section 3.2, <i>Cultural Resources</i> .
Hazardous Materials and Wastes	No impacts on or resulting from groundwater contamination, hazardous materials storage sites, or hazardous waste storage sites. Negligible impacts resulting from potential generation of regulated waste from heavy-metal dust, soil vapor, or hazardous residues. Regulated wastes would be contained and disposed of by a licensed contractor. Long-term impacts would be beneficial due to a reduced consumption rate of chemicals as a result of implementation of the Preferred Alternative. Containers would be recycled or disposed of once considered clean of potential hazardous materials or wastes.	Impacts on or resulting from hazardous materials and wastes would be the same as those described for the Preferred Alternative.	Conditions would remain as described in Section 3.3, <i>Hazardous Materials and Wastes</i> .
Safety	Long-term beneficial impacts on safety, including indoor air quality, installation of fire detection and suppression systems, lighting improvements, and replacement of aging infrastructure. No impacts on runway accident protection zones.	Impacts on safety would be the same as those described for the Preferred Alternative.	Conditions would remain as described in Section 3.4, <i>Safety</i> .
Socioeconomics	Short-term negligible impacts resulting from changes in workloads to work activities; however there would be no gain or loss of personnel. The generation of temporary construction jobs for off-base personnel, and the need for swing shifts or a similar option to maintain cleaning line workload productivity would result in temporary beneficial impacts. No long-term impacts on local socioeconomic conditions.	Potentially significant short-term adverse impacts on B3001 cleaning line personnel during renovation activities if furloughs or layoffs were to occur due to complete shutdown of cleaning line operations. No long-term impacts on local socioeconomic conditions.	Conditions would remain as described in Section 3.5, <i>Socioeconomics</i> .

Table 2-3. Summary of Impacts for Fully Evaluated Resources (Continued)

Resource/Issue	Preferred Alternative	Alternative 2	No-Action Alternative
Sustainability	Long-term beneficial impacts on sustainability through reduced energy consumption and increased operational efficiency.	Long-term beneficial impacts on sustainability that would occur sooner than those described for the Preferred Alternative.	Conditions would remain as described in Section 3.6, <i>Sustainability</i> .
Water Resources	<p>Long-term operations of the system would not affect surface water; non-galvanized scrubbers may be installed, which would not impact water quality of runoff. No impacts on wetlands or floodplains.</p> <p>No impacts on groundwater aquifer recharge as there would be no increase in impermeable surfaces.</p> <p>Long-term beneficial impacts on water resources through reduced water consumption and reduced wastewater load to the industrial wastewater treatment plant.</p>	Beneficial impacts on water resources would be the same as those described for the Preferred Alternative but would occur sooner than for the Preferred Alternative.	Conditions would remain as described in Section 3.7, <i>Water Resources</i> .

Table 2-4 provides a summary of resource areas that are not evaluated because no impacts on those resources would result from implementation of the Preferred Alternative, Alternative 2, or the No-Action Alternative.

Table 2-4. Summary of No Impact for Resources not Evaluated Further

Resource/Issue	Preferred Alternative	Alternative 2	No-Action Alternative
Biological Resources	Implementation of the Preferred Alternative would occur only within the interior and a portion of the rooftop of B3001. No component actions of the Preferred Alternative would occur in or adjacent to areas supporting biological resources (e.g., habitat in developed or undeveloped areas) would occur. Therefore, impacts on or from biological resources would not result, and conditions would remain unchanged from existing conditions. No further biological resources analysis was performed.	For reasons similar to those associated with the Preferred Alternative, implementation of Alternative 2 would not result in impacts on or from biological resources and conditions would remain unchanged from existing conditions. No further biological resources analysis was performed.	Existing conditions would remain.

Table 2-4. Summary of No Impact for Resources not Evaluated Further (Continued)

Resource/Issue	Preferred Alternative	Alternative 2	No-Action Alternative
Environmental Justice and Protection of Children	All impacts associated with the Preferred Alternative would be localized to the project site and would not directly or indirectly impact potential minority populations or low-income populations that may occur within the vicinity of Tinker AFB. Implementation of the Preferred Alternative would take place entirely within a controlled access area within the perimeter of Tinker AFB and would not extend to areas where children could be affected. Therefore, no further analysis of environmental justice or the protection of children was performed.	For reasons similar to those associated with the Proposed Action, implementation of Alternative 2 would not impact minority populations or low-income populations or areas where children could be affected. Therefore, no further analysis environmental justice or the protection of children was performed.	The No Action Alternative would have neither beneficial nor adverse effects on environmental justice and protection of children. Existing conditions would remain.
Geology and Soils	Implementation of the Preferred Alternative would not impact geological resources and existing conditions would remain unchanged. Cutting into the concrete building slab would occur but would not impact geological resources. Therefore, no further geology and soils analysis was performed.	For reasons similar to the Preferred Alternative, implementation of Alternative 2 would result in no impact to geological resources. Therefore, no further geology and soils analysis was performed.	Existing conditions would remain.
Land Use	Implementation of the Preferred Alternative would involve renovations of the interior and a portion of the rooftop of B3001 and would not result in any change in the land use designation of the proposed project area. Land use of the proposed project area would remain consistent with the Tinker AFB <i>General Plan</i> (Tinker 2005b). No new types of land use activities would be introduced onto Tinker AFB as a result of the Preferred Alternative. Therefore, impacts on or from land use would not result and conditions would remain unchanged from existing conditions and no further land use analysis was performed.	For reasons similar to those identified under the Preferred Alternative, implementation of Alternative 2 would not result in impacts on or from land use and existing conditions would remain unchanged. Therefore, no further land use analysis was performed.	Existing conditions would remain.

Table 2-4. Summary of No Impact for Resources not Evaluated Further (Continued)

Resource/Issue	Preferred Alternative	Alternative 2	No-Action Alternative
Noise and Vibration	Implementation of the Preferred Alternative would include short-term construction noise. No change in long-term, operation-related noise would occur because operations activities would remain the same as currently conducted in the cleaning line area in B3001. B3001 is located immediately east of the runway and Tinker AFB airfield, which is in constant use. Noise generated during renovation activity would be similar to ambient noise levels at Tinker AFB. Therefore, ambient noise and vibrations at Tinker AFB would remain relatively unchanged from existing conditions, and no further noise and vibration analysis was performed.	For reasons similar to those identified for the Preferred Alternative, implementation of Alternative 2 would not result in impacts on noise and vibration. Therefore, no further noise and vibration analysis was performed.	Existing conditions would remain.
Transportation and Circulation	Implementation of the Preferred Alternative would involve renovations to the interior and a portion of the rooftop of B3001 and would not result in closures of any roads on base. Temporary staging areas for construction equipment would be inside B3001 or on paved areas adjacent to the B3001 perimeter; no parking areas or roads would be used for staging areas. Construction equipment would be driven to the site and would remain there for the duration of renovation activities (approximately five years); there would be no impacts on traffic flow from construction equipment. No further analysis on transportation and circulation was performed.	Implementation of Alternative 2 would enable renovation activities to be completed within one or two years. For reasons similar to the Preferred Alternative, implementation of Alternative 2 would not result in impacts on transportation or circulation. Therefore, no further analysis on transportation and circulation was performed.	Existing conditions would remain.

Table 2-4. Summary of No Impact for Resources not Evaluated Further (Continued)

Resource/Issue	Preferred Alternative	Alternative 2	No-Action Alternative
Visual Resources	Implementation of the Preferred Alternative would involve renovations to the interior and a portion of the rooftop of B3001 and would not result in any change in the aesthetics of the proposed project area. Rooftop equipment on B3001 would be of similar size to equipment currently mounted on the roof (e.g., air conditioning units, ventilation systems) and would not alter the existing aesthetics of B3001. Therefore, no further visual resources analysis was performed.	For reasons similar to the Preferred Alternative, implementation of Alternative 2 would not result in impacts on visual resources. No further visual resources analysis was performed.	Existing conditions would remain.

THIS PAGE INTENTIONALLY LEFT BLANK

SECTION 3.0

AFFECTED ENVIRONMENT

This section describes relevant existing environmental conditions for resources potentially affected by implementation of the Proposed Action. In compliance with NEPA, CEQ regulations, and 32 CFR 989, the description of the affected environment focuses on only those resources potentially subject to impacts.

Due to the nature of the Proposed Action, the affected environment description is limited primarily to Tinker AFB and surrounding areas within Oklahoma County. Resource areas that clearly would not be affected by the Proposed Action are omitted from discussion and include the following: biological resources, environmental justice and protection of children, geology and soils, land use, noise and vibration, transportation and circulation, and visual resources. Resource descriptions focus on the following areas: air quality, cultural resources, hazardous materials and wastes, safety, socioeconomics, sustainability, and water resources.

3.1 Air Quality

3.1.1 Definition of Resource

Air quality in a given location is determined by the concentration of various pollutants in the atmosphere. National Ambient Air Quality Standards (NAAQS) are established by the U.S. Environmental Protection Agency (EPA) under the Clean Air Act (CAA) for criteria pollutants, including ozone, carbon monoxide (CO), nitrogen dioxide (NO₂), sulfur dioxide (SO₂), particulate matter equal to or less than 10 microns in diameter (PM₁₀), particulate matter equal to or less than 2.5 microns in diameter (PM_{2.5}), and lead. The primary NAAQS set limits to protect public health, including sensitive populations such as children, the elderly, and individuals suffering from respiratory disease, with an adequate margin of safety. The secondary NAAQS set limits to protect public welfare, including protection against decreased visibility, damage to animals, crops, vegetation, and buildings.

Air quality management at USAF installations is established in AFI 32-7040, *Air Quality Compliance*. AFI 32-7040 requires installations to achieve and maintain compliance with all applicable federal, state, and local standards.

EO 13514, *Federal Leadership in Environmental Energy, and Economic Performance*, introduced new greenhouse gas (GHG) emission management requirements for the federal government. The EO requires agencies to establish reduction targets for GHG emissions as well as to develop an inventory of GHG emissions. The principal GHGs that enter the atmosphere because of human activities include carbon dioxide (CO₂), methane (CH₄), nitrous oxide (N₂O), and fluorinated gases.

3.1.1.1 Criteria Pollutants

Air quality is affected by emissions from stationary sources (e.g., industrial development), fugitive sources (e.g., windblown dust), and mobile sources (e.g., motor vehicles). Air quality at a given location is a function of several factors, including the quantity and type of pollutants emitted locally and regionally and the dispersion rates of pollutants in the region. Factors affecting pollutant dispersion include wind speed, wind direction, atmospheric stability, temperature, the presence or absence of inversions, and topography.

Ozone. The majority of ground-level (i.e., terrestrial) ozone is formed as a result of complex photochemical reactions in the atmosphere involving volatile organic compounds and nitrogen oxides in the presence of sunlight. Ozone is a highly reactive gas that damages lung tissue, reduces lung function and sensitizes the lung to other irritants. Although stratospheric ozone shields the earth from damaging ultraviolet radiation, ground-level ozone is a highly damaging air pollutant and is the primary source of smog. In March 2008, EPA published a new standard for 8-hour ozone and revoked the 1-hour NAAQS for ozone in most areas. The 8-hour standard is more protective of public health and more stringent than the 1-hour standard, and nonattainment areas for the 8-hour ozone standard have now been established. On 19 January 2010, EPA published in the *Federal Register* as RIN 2060–AP98, Volume 75, Number 11, a proposed new rule revising the NAAQS for ground-level ozone. The comment period for proposed revisions to the ozone standard ended on 22 March 2010. As of the date of this report, the proposed revisions for a new ground-level ozone standard have not been published in the *Federal Register*.

Carbon Monoxide. CO is a colorless, odorless, poisonous gas produced by incomplete burning of carbon in fuel. The health threat from CO is most serious for those who suffer from cardiovascular disease, particularly those with angina and peripheral vascular disease.

Nitrogen Dioxide. NO₂ is a highly reactive gas that can irritate the lungs, cause bronchitis and pneumonia, and lower resistance to respiratory infections. Repeated exposure to high concentrations of NO₂ may cause acute respiratory disease in children. Because NO₂ is an important precursor in the formation of ozone or smog, control of NO₂ emissions is an important component of overall pollution reduction strategies. The two primary sources of NO₂ in the U.S. are fuel combustion and transportation emissions. On 22 January 2010, EPA strengthened the health-based NAAQS for NO₂. This action set a new 1-hour standard that defines the maximum allowable concentration observed in any monitoring area. The new NAAQS for NO₂ was published in the *Federal Register* on 9 February 2010 as RIN 2060–AO19, Volume 75, Number 26.

Sulfur Dioxide. SO₂ is emitted primarily from stationary-source coal and oil combustion, steel mills, refineries, pulp and paper mills, and nonferrous smelters. High concentrations of SO₂ may aggravate existing respiratory and cardiovascular disease; asthmatics and those with emphysema or bronchitis are the most sensitive to SO₂ exposure. SO₂ also contributes to acid rain, which can lead to the acidification of lakes and streams and damage trees. On 2 June 2010, EPA

strengthened the primary NAAQS for SO₂. The new NAAQS for SO₂ established a new 1-hour standard to protect the public from high, short-term exposures to SO₂. Additionally, EPA is revoking the existing annual and 24-hour standards due to insufficient evidence linking long-term exposure to SO₂ and health effects. The secondary SO₂ NAAQS 3-hour standard of 0.5 parts per million, established to protect the public welfare including effects on soil, water, visibility, wildlife, crops, vegetation, national monuments and buildings, will remain in effect, but the EPA is assessing the need for a change to the standard under a separate review.

Particulate Matter (PM₁₀ and PM_{2.5}). Particulate matter is a mixture of tiny particles that vary greatly in shape, size, and chemical composition and can comprise metals, soot, soil, and dust. PM₁₀ includes large, coarse particles, whereas PM_{2.5} includes small, fine particles. Sources of coarse particles include crushing or grinding operations and dust from paved or unpaved roads. Sources of fine particles include all types of combustion activities (e.g., motor vehicles, power plants, wood burning) and certain industrial processes. Exposure to PM₁₀ and PM_{2.5} levels exceeding current standards can result in increased occurrences of lung- and heart-related respiratory illnesses. EPA has concluded that finer particles (less than 2.5 microns in diameter) are more likely to contribute to long-term health problems than particles greater than 10 microns in diameter, which typically result in short-term health problems.

Airborne Lead. Airborne lead can be inhaled directly or ingested indirectly by consuming lead-contaminated food, water, or nonfood materials such as dust or soil. Fetuses, infants, and children are most sensitive to lead exposure, which has been identified as a factor in high blood pressure and heart disease. Exposure to lead has declined dramatically in the last several decades as a result of the reduction of lead in gasoline and paint, and the elimination of lead from soldered cans.

Current standards for Criteria Pollutants are included in Table 3-1.

Table 3-1. Criteria Pollutant Standards

Pollutant	Primary/Secondary	Averaging Time	Level	Form
Carbon monoxide	primary	8-hour	9 ppm	Not to be exceeded more than once per year
		1-hour	35 ppm	
Lead	primary and secondary	Rolling 3 month average	0.15 µg/m ³ ⁽¹⁾	Not to be exceeded
Nitrogen dioxide	primary	1-hour	100 ppb	98th percentile, averaged over 3 years
	primary and secondary	Annual	53 ppb ⁽²⁾	Annual mean
Ozone	primary and secondary	8-hour	0.075 ppm ⁽³⁾	Annual fourth-highest daily maximum 8-hour concentration, averaged over 3 years
Particle Pollution	primary and secondary	Annual	15 µg/m ³	annual mean, averaged over 3 years
		24-hour	35 µg/m ³	98th percentile, averaged over 3 years
	primary and secondary	24-hour	150 µg/m ³	Not to be exceeded more than once per year on average over 3 years
Sulfur dioxide	primary	1-hour	75 ppb ⁽⁴⁾	99th percentile of 1-hour daily maximum concentrations, averaged over 3 years
	secondary	3-hour	0.5 ppm	Not to be exceeded more than once per year
<p>(1) Final rule signed October 15, 2008. The 1978 lead standard (1.5 µg/m³ as a quarterly average) remains in effect until one year after an area is designated for the 2008 standard, except that in areas designated nonattainment for the 1978, the 1978 standard remains in effect until implementation plans to attain or maintain the 2008 standard are approved.</p> <p>(2) The official level of the annual NO₂ standard is 0.053 ppm, equal to 53 ppb, which is shown here for the purpose of clearer comparison to the 1-hour standard.</p> <p>(3) Final rule signed March 12, 2008. The 1997 ozone standard (0.08 ppm, annual fourth-highest daily maximum 8-hour concentration, averaged over 3 years) and related implementation rules remain in place. In 1997, EPA revoked the 1-hour ozone standard (0.12 ppm, not to be exceeded more than once per year) in all areas, although some areas have continued obligations under that standard (“anti-backsliding”). The 1-hour ozone standard is attained when the expected number of days per calendar year with maximum hourly average concentrations above 0.12 ppm is less than or equal to 1.</p> <p>(4) Final rule signed June 2, 2010. The 1971 annual and 24-hour SO₂ standards were revoked in that same rulemaking. However, these standards remain in effect until one year after an area is designated for the 2010 standard, except in areas designated nonattainment for the 1971 standards, where the 1971 standards remain in effect until implementation plans to attain or maintain the 2010 standard are approved.</p> <p>Source: EPA 2011b.</p>				

3.1.1.2 Greenhouse Gases

GHGs are measured by the global warming potential that a given type of GHG may cause. The functionally equivalent amount or concentration of CO₂ is used as the reference for measuring global warming potential. Equivalent carbon dioxide (CO₂e) is a unit of measurement for describing GHG concentration. Principal GHGs that enter the atmosphere because of human activities are described below.

Carbon Dioxide. CO₂ is a GHG that enters the atmosphere through the burning of fossil fuels (e.g., oil, natural gas, coal), solid waste, trees and wood products, and also as a result of chemical reactions (e.g., manufacture of cement). The two primary sources of CO₂ in the U.S. are fuel combustion and transportation emissions. CO₂ can be removed from the atmosphere (or “sequestered”) when it is absorbed by plants as part of the photosynthesis process and biological carbon cycle (simply put, a plant takes in CO₂ molecules and combines them with water molecules to make a sugar that feeds the plant, excess oxygen splits from the CO₂ molecules through a sunlight-driven process and is released back into the atmosphere). However, in areas where CO₂ concentration ratios may exceed the intake capabilities of plants, this gas contributes negatively to GHG effects.

Methane. Methane is a GHG that is emitted during the production and transport of coal, natural gas, and oil. Methane emissions also result from livestock and other agricultural practices and by the decay of organic waste in municipal solid waste landfills.

Nitrous Oxide. Nitrous oxide is a GHG that is emitted during agricultural and industrial activities, as well as during combustion of fossil fuels and solid waste.

Fluorinated Gases. Hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), sulfur hexafluoride (SF₆), chlorofluorocarbons (CFCs), and hydrochlorofluorocarbons (HCFC) are synthetic GHGs with high CO₂e factors that are emitted from a variety of industrial processes. HFCs, PFCs, and SF₆ are sometimes used as substitutes for ozone-depleting fluorinated gases (i.e., CFCs, HCFCs, and halons). HFCs, PFCs, and SF₆ are typically emitted in smaller quantities and, although these substances do not deplete ozone, they are potent GHGs and are referred to as *high global warming potential gases*.

3.1.1.3 Clean Air Act Amendments

The Clean Air Act Amendments (CAAA) of 1990 place most of the responsibility to achieve compliance with NAAQS on individual states. Areas not in compliance with any of the NAAQS can be declared *nonattainment* areas by EPA or the appropriate state or local agency. Nonattainment areas are declared for each specific pollutant addressed by the NAAQS. Once EPA declares an area as *nonattainment*, EPA requires the state to prepare a State Implementation Plan (SIP). A SIP is a compilation of goals, strategies, schedules and enforcement actions that will lead the state into compliance with the NAAQS. Should the state and local air agencies fail to develop adequate SIPs, EPA will develop a Federal Implementation Plan to remedy the state’s failure. To be redesignated to *attainment*, the state must show through monitoring and modeling that pollutant levels are consistently meeting the NAAQS and have been maintained for a period

of 10 consecutive years. During this period of time, the declared area is in transitional attainment, better known as a *maintenance area*.

Under 40 CFR 93, EPA issued conformity regulations that mandate the federal government not to engage, support, or provide financial assistance for licensing or permitting, or approval of any activity that does not conform to an approved SIP or Federal Implementation Plan. This rule applies to all federal actions except for those projects requiring funding or approval from the U.S. Department of Transportation, the Federal Highway Administration, the Federal Transit Administration, or the metropolitan planning organization; these projects must instead comply with the conformity rules established by the U.S. Department of Transportation. The General Conformity Rule establishes conformity as a process in which economic, environmental, and social aspects of transportation and air quality planning are considered. This rule is required for any federal action that results in direct and indirect emissions for criteria pollutants in a *nonattainment* or *maintenance area* that exceed the rates specified in 40 CFR 93.153(b)(1) and (2).

3.1.1.4 Regulatory Changes

Air quality regulatory standards are periodically reviewed by EPA. Both the Oklahoma Department of Environmental Quality (DEQ) Air Quality Division and EPA are planning for review of major environmental laws that will likely result in more stringent standards for the criteria pollutants and the determination of *prevention of significant deterioration* (PSD) rules. The changes that are expected to have the greatest impact on the proposed action are changes to the NAAQS.

EPA's Fall 2009 Regulatory Plan and Semiannual Regulatory Agenda identifies the agency's plans to reexamine NAAQS for particulate matter, SO₂, ozone, and NO₂ and to determine the PSD implications of declaring CO₂ as an air quality pollutant. The anticipated revision of the NAAQS for ground-level ozone to an estimated range of 60 to 70 parts per billion would place Oklahoma County in nonattainment status for ozone (EPA 2010a, 2010b). In 2010, EPA strengthened the SO₂ and NO₂ standards and has received comments regarding the proposed revisions to ground-level ozone. As of the date of this report, proposed revisions for a new ground-level ozone standard have not been published or established in the *Federal Register*.

On 13 May 2010, EPA issued the final rule on addressing GHG emissions from stationary sources under the CAA. This final rule, also known as the Tailoring Rule, establishes a schedule of CAA permitting programs to define which facilities will be required to obtain PSD and Title V permits. The first scheduled phase began on 2 January 2011, establishing a GHG permitting program for large GHG emitters such as power plants, refineries, and cement production facilities subject to PSD permitting. Under this new rule, any newly constructed facility or existing facility modified in a way that significantly increases emissions of a pollutant other than GHGs, will be subject to permitting requirements for GHG emissions under the PSD program. For these projects, only GHG emissions above 75,000 tons per year (tpy), on a CO₂e basis, will be required to undergo a best available control technology analysis. Similarly, under

the operating permit program only sources subject to the program (i.e., newly constructed or existing major sources for pollutants other than GHGs) will be subject to a Title V requirements for GHG (EPA 2010f).

Phase 2 of this rule will begin in July 2011 and continue through June 2013. This phase will involve sources subject to PSD permitting requirements for new construction projects that emit GHG emissions of at least 100,000 tpy even if they do not exceed PSD permitting thresholds for any other pollutant. Modifications of existing facilities that increase GHG emissions by at least 75,000 tpy will be subject to permitting requirements, even if they do not significantly increase emissions of any other pollutant. Additionally, operating permit requirements will, for the first time, apply to sources based on their GHG emissions even if they do not apply based on emissions of other pollutants. Facilities emitting at least 100,000 tpy of CO₂e will be subject to Title V permitting requirements (EPA 2010f).

3.1.1.5 Energy and Sustainability

EO 13514, *Federal Leadership in Environmental, Energy, and Economic Performance*, was issued on 4 October 2009. The EO concentrates the attention of federal agencies on promoting the establishment of an integrated system that promotes environmental sustainability by federal government agencies and emphasizes the reduction of GHG emissions. The principal GHGs that enter the atmosphere due to human activities include CO₂, methane, nitrous oxide and fluorinated gases. The federal government is taking actions to reduce GHGs through means such as streamlining infrastructure to minimize vehicle use and vehicle emissions (i.e., idling), and reducing facility consumption of energy by implementing energy conservation projects.

To comply with EO 13514, the proposed project has been evaluated for its impact on the federal government's goal to reduce GHG emissions by reducing energy consumption through strategic sustainable development, energy-efficient building design, and environmentally friendly building material selection. The project alternatives have been evaluated for their adherence to the EO and the *Federal Leadership in High Performance and Sustainable Buildings Memorandum of Understanding* referenced within the EO, as it pertains to identifying energy-reduction opportunities and siting considerations.

3.1.1.6 Indoor Air Quality

Indoor air quality refers to the air quality within and around buildings and structures, especially as it relates to the health and comfort of building occupants. Indoor pollution sources that release gases or particles into the air are the primary source of indoor air quality problems within buildings. Indoor air pollution sources are various and may include combustion sources (e.g., oil, coal, gas), building materials (e.g., asbestos-containing insulation, carpet, wood cabinetry), cleaning products, or heating, ventilation, and cooling systems (EPA 2008). Exposure to indoor air pollution can result in health problems such as sore eyes, headaches, fatigue, respiratory illness, cancer, or heart disease (EPA 2008).

Proper indoor air ventilation systems assist in removing fumes and pollutants from operations. Without proper ventilation systems within a building, airborne fumes and pollutants remain and

potentially concentrate within a building's indoor air environment. Personnel within a building are exposed to inhalation of these fumes and pollutants, presenting potential health risks to workers and other visitors to the facility. Indoor air quality is federally monitored by the EPA and the National Institute for Occupational Safety and Health, and at the state level through the Oklahoma State Department of Health. Indoor air quality monitoring and testing is also performed by the Tinker AFB Bioenvironmental Engineering office.

3.1.2 Existing Conditions

3.1.2.1 Climate

Oklahoma County is located in the Interior Lowlands physiographic region. The county has two major land resource areas (MLRAs): the eastern half of the county is in the Northern Cross Timbers MLRA, and the western half is in the Central Rolling Red Prairies MLRA (U.S. Department of Agriculture 2003). In winter, the average daily temperature is 38.6 degrees Fahrenheit (°F), and the average daily minimum temperature is 27.8°F. In summer the average temperature is 80°F, and the average daily maximum temperature is 91.1°F. The average annual precipitation is 33.35 inches. The majority of precipitation, 74 percent, usually falls from April through October; the average seasonal snowfall is 9.1 inches. Prevailing winds blow from the south with the average speed of 14 miles per hour in March and April (U.S. Department of Agriculture 2003).

3.1.2.2 Local Air Quality

Oklahoma County is currently designated by EPA as an *attainment* area for CO, SO₂, NO₂, and particulate matter (PM₁₀ and PM_{2.5}). A five-year ozone *Early Action Compact* for Oklahoma City was initiated and was completed in December 2007. In June 2008, the Association of Central Oklahoma Governments (ACOG) developed an 8-hour ozone flex plan for Oklahoma City for the successive five years, similar to the ozone *Early Action Compact* (ACOG 2008). This voluntary plan identified strategies that would reduce transportation-related emissions by improving traffic flow and reducing congestion throughout the region. Typical control strategies included intersection improvements, traffic signal modifications, signal coordination efforts, intelligent transportation techniques, and travel reduction programs.

Eleven air quality monitoring stations are located within Oklahoma County, including one CO monitoring station, one PM₁₀ monitoring station, three PM_{2.5} monitoring stations, one SO₂ monitoring station, three ozone monitoring stations, and two NO₂ monitoring stations. According to EPA AirData, ambient-level concentrations for PM₁₀, PM_{2.5}, NO₂, and CO within Oklahoma County have not exceeded the primary NAAQS during the years 1998 to 2008; however, concentrations of ozone have exceeded the 8-hour NAAQS within the same period (EPA 2010f).

3.1.2.3 Tinker AFB

The DEQ, which publishes regulations for air quality and permitting for all counties in Oklahoma, has jurisdiction over and regulates air emissions associated with Tinker AFB. Under the CAAA, the Title V Operating Permit Program imposes requirements for air quality permitting on air emission sources. Also under the CAAA, the National Emission Standards for Hazardous Air Pollutants (NESHAP) program specifies various provisions for regulated sources, including limits on hazardous air pollutant (HAP) emissions, compliance demonstrations and performance testing, monitoring, recordkeeping, and reporting. Tinker AFB is categorized as a major source under the Title V program and is also regulated under the NESHAP since its potential emissions from stationary sources exceed 100 tpy of any of the criteria pollutants, or 10 tpy of any single HAP, or 25 tpy of any combination of HAPs. Tinker AFB maintains a Title V Air Permit (DEQ 2010). The following are the primary onsite emission sources at Tinker AFB:

- Stationary combustion sources (e.g., boilers, water heaters, furnaces, gasoline and diesel-fuel generators, engine test cells).
- Operational sources (e.g., chemical usage, paints, degreasers, abrasive blasting, welding operations, fuel cell maintenance, wastewater treatment, small arms firing range).
- Fuel-storage/transfer operations (e.g., horizontal tanks, internal floating roof tanks).
- Mobile sources (e.g., vehicle operations, aircraft operations, trim and power checks, aerospace ground equipment). Mobile sources are not regulated under the Title V program but rather fall under the Non-Road Mobile Source program, Fuel Efficiency and Corporate Average Fuel Economy standards.

3.1.2.4 Proposed Project Location

Building 3001 is located on the eastern portion of Tinker AFB and is identified as the largest building in Oklahoma, measuring approximately 3,374 feet by 926 feet and occupying an area of approximately 2,196,610 sf (50 acres). In addition to the existing cleaning line installed in 1978, B3001 houses facilities for the 76th Maintenance Wing to conduct overhaul, repair, and test activities for aircraft fuel control accessories. Aircraft engine parts are brought to the cleaning line at B3001 from squadron maintenance departments throughout Tinker AFB and occasionally other USAF bases. B3221 has an area of approximately 119,232 sf and is located southeast of B3001. B3221 has existing facilities that can accommodate a portion of the current cleaning line workload; however, the B3221 does not have capacity to accommodate the entire current cleaning line workload.

The ventilation system for the cleaning line within B3001 does not require monitoring for air quality, as it uses scrubbers to remove some exhaust chemicals; other chemicals used in the cleaning line process do not require tracking and are exhausted via the air system in B3001. In addition to emissions generated by operations within the buildings, B3001 and B3221 are located above groundwater contamination sites that could produce soil vapors.

No lead based paint or asbestos containing materials are believed to exist at the proposed project location due to a fire that occurred in 1984 (Personal communication, Roger Feltman, 6 April 2011). As a result of the fire, the cleaning line shop was replaced in its entirety.

3.2 Cultural Resources

3.2.1 Definition of Resource

Cultural resources represent and document activities, accomplishments, and traditions of previous civilizations and link current and former inhabitants of an area. Depending on their conditions and historic use, these resources may provide insight to living conditions in previous civilizations and may retain cultural and religious significance to modern groups.

Archaeological resources include areas where prehistoric or historic activity measurably altered the environment or deposits of physical remains (e.g., arrowheads, bottles) discovered therein. Architectural resources include standing buildings, districts, bridges, dams, and other structures of historic or aesthetic significance. *Architectural resources* generally must be more than 50 years old to be considered for inclusion in the National Register of Historic Places (NRHP), an inventory of culturally significant resources identified in the United States; however, more recent structures, such as Cold War-era resources, may warrant protection if they have the potential to gain significance in the future. *Traditional cultural resources* can include archaeological resources, structures, neighborhoods, prominent topographic features, habitats, plants, animals, and minerals that Native Americans or other groups consider essential for the persistence of traditional culture.

The principal federal law addressing cultural resources is the National Historic Preservation Act (NHPA) of 1966, as amended (16 USC § 470), and its implementing regulations (36 CFR 800). These regulations, commonly referred to as the Section 106 process, describe the procedures for identifying and evaluating historic properties, assessing the effects of federal actions on historic properties, and consulting to avoid, reduce, or minimize adverse effects. As part of the Section 106 process, agencies are required to consult with the State Historic Preservation Office.

The term *historic properties* refers to cultural resources that meet specific criteria for eligibility for listing on the NRHP; historic properties need not be formally listed on the NRHP. Section 106 does not require the preservation of historic properties but ensures that the decisions of federal agencies concerning the treatment of these places result from meaningful considerations of cultural and historic values and of the options available to protect the properties. The Proposed Action is an undertaking as defined by 36 CFR 800.3 and is subject to requirements outlined in Section 106.

The Department of Defense (DoD) *American Indian and Alaska Native Policy* governs the department's interactions with federally recognized tribes. The policy outlines DoD trust obligations, communication procedures with tribes on a government-to-government basis, consultation protocols, and actions to recognize and respect the significance that tribes ascribe to certain natural resources and properties of traditional cultural or religious importance.

The policy requires consultation with federally recognized tribes for proposed activities that could significantly affect tribal resources or interests.

3.2.2 Existing Conditions

3.2.2.1 Regional History

Inhabited by plains tribes and sold to the United States by France as a part of the 1803 Louisiana Purchase, much of what is now Oklahoma was subsequently designated as Indian Territory. As such, it was intended to provide a new home for tribes forced by the federal government to abandon their ancestral lands in the southeastern United States. Many of those forced to relocate in the 1830s were from what were called the Five Civilized Tribes—Cherokee, Choctaw, Chickasaw, Creek, and Seminole—who set up independent nations in the new Indian Territory. After the Civil War, westward expansion brought railroads into the Indian Territory, where the U.S. government began to declare some land available for settlement. Prairie land surrounding a Santa Fe railroad boxcar station was designated as a townsite when presidential proclamation opened the central portion of the Indian Territory to claim-stakers in 1889.

That settlement (now Oklahoma City) attained official status in 1890, just a few weeks after the western half of the Indian Territory was redesignated Oklahoma Territory. Railroad connections to the city helped make it a center for trade, milling, and meat packing (Oklahoma City Convention and Visitors Bureau 2010).

3.2.2.2 Tinker AFB

Tinker AFB has implemented an Integrated Cultural Resources Management Plan (ICRMP) that is designed to assist the installation in continuing to maintain and operate existing facilities and to develop new facilities, as needed, in compliance with federal and state legislation protecting cultural resources (Tinker AFB 2005a). Cultural resources are protected under the NHPA of 1966, as amended. Significant archaeological and historic architectural resources that have not been evaluated must be considered eligible for the NRHP until appropriately evaluated and State Historic Preservation Office concurrence has been documented (Tinker AFB 2005a).

The entire land area of Tinker AFB has been surveyed for archeological resources, and four archaeological sites have been identified at Tinker AFB (Tinker AFB 2005b). Three sites have been determined to be eligible for listing in the NRHP, and one site has been determined to be ineligible for listing in the NRHP. The sites of the Preferred Alternative and Alternative 2 (B3001 and B3221) are within the Tinker AFB Airfield and no archaeological sites are within the project area. Two historic property types have been identified at Tinker AFB: facilities associated with aircraft construction and modification, 1942-1946; and facilities associated with the Cuban Missile Crisis, 1962. Tinker AFB has six buildings individually eligible for listing in the NRHP and the Douglas Cargo Aircraft Manufacturing Historic District which is also eligible for listing in the NRHP. Modification to one of these buildings – B3001 – is included in the Proposed Action.

Douglas Cargo Aircraft Manufacturing Historic District

The Douglas Cargo Aircraft Manufacturing Historic District contains 7 contributing and 14 noncontributing resources. The primary contributing building in the district is the Douglas Assembly Building (B3001). B3001 is also individually eligible for the NRHP. To the east of B3001 are smaller contributing structures (B3202, B3203, B3204, and B3303), which were originally used to serve the electrical, water, and fire safety needs of B3001. Between the rear west side of B3001 and the north/south runway (Runway 17/35) are two larger contributing buildings, which were part of the original plant operations: the woodworking mill (B3113) and a painting hangar (B3105). The buildings within the historic district share similar features such as concrete copings and, on the larger buildings, exterior bands of contrasting brick that run horizontally. B3001 dominates the district and continues to define the relationships and associations of the smaller accessory structures, despite the presence of the newer, intrusive structures (Tinker AFB 2005b).

The buildings and structures in the Douglas Cargo Aircraft Manufacturing Historic District are historically significant for their role in the Douglas Cargo Aircraft Plant's World War II efforts to produce C-47 transport aircraft for the Army. B3001 also has architectural significance because of its size, which is approximately 3,374 feet long and 926 feet wide, making it the largest building in Oklahoma. The Douglas Cargo Aircraft Manufacturing Historic District is eligible for listing in the NRHP for its role in military history and for its unique architectural features.

Tinker AFB has consulted with three Native American tribes: Seminole Nation, Osage Nation, and Muskogee Nation. These tribes have verbally commented that they have no Native American Graves Protection and Repatriation Act or American Indian Religious Freedom Act concerns about Tinker AFB property. Additionally, they have communicated that Tinker AFB property is not suitable for religious or burial sites (Tinker AFB 2005a). The site of both the Preferred Alternative and Alternative 2 are within the Tinker AFB airfield and contain no known or suspected traditional cultural properties.

3.2.2.3 Historic Resources at the Proposed Project Locations

B3001 was constructed between 1942 and 1943 as part of the Douglas Cargo Aircraft Plant. The building is 0.75 mile long and nearly 1,000 feet wide at its widest point. Large hangar doors are affixed to the south and north façades of the building, and an additional hangar door is on the rear (i.e., west façade) of the building, facing the runway. The main pedestrian entry is near the center of the east façade. B3001 is considered historically significant for its role in the Douglas Cargo Aircraft Plant's World War II efforts to produce C-47s (carrier aircraft) for the Army. Architecturally significant features of B3001 as defined in the Tinker AFB ICRMP (Tinker AFB 2005a) include:

- Design – B3001 is the largest building in Oklahoma, measured at approximately 3,374 feet by 926 feet. It was constructed in the International style and designed as a blackout plant—completely windowless, artificially lit, and air-conditioned.

- Distinctive ornamentation – Four bands of black brick run horizontally around the entire building in a contrasting color to the red brick façade. A concrete band runs horizontally around the building just below the contrasting brick bands.
- Exterior finish – Red brick laid in a common-bond pattern.
- Doors – Large hangar doors on south and north façades.
- Roof – Flat roof, in keeping with International style of design (architectural style characterized by undecorated rectilinear forms and the use of glass, steel, and reinforced concrete).
- Entrance – Formal entrance on east façade, with three double doors set into a large concrete surround that is accessed by steps.
- Foundation – Concrete foundation rises approximately 6 inches above grade.

B3001 is the primary contributing building of the Douglas Cargo Aircraft Manufacturing Historic District and is individually eligible for the NRHP (Tinker AFB 2005a).

3.3 Hazardous Materials and Wastes

3.3.1 Definition of Resource

Hazardous materials are considered to be any item or agent (biological, chemical, physical) that has the potential to cause harm to humans, animals, or the environment, either alone or through interaction with other factors. Hazardous materials and wastes are defined and regulated by the EPA, U.S. Occupational Safety and Health Administration, the U.S. Department of Transportation, and the U.S. Nuclear Regulatory Commission; each agency has its own definition of a hazardous material. In general, hazardous materials and wastes are defined as substances with strong physical properties of ignitability, corrosivity, reactivity, or toxicity that may cause an increase in mortality, a serious irreversible illness or incapacitating reversible illness, or pose a substantial threat to human health or the environment. Hazardous wastes are defined by the EPA as solid wastes (as defined in 40 CFR 261.2) that meet any of several criteria outlined in 40 CFR 261.3.

Issues associated with hazardous materials and wastes typically focus on underground storage tanks (USTs); aboveground storage tanks (ASTs); and the storage, transport, and use of pesticides, bulk fuel, petroleum, oils and lubricants. In addition, storage and transportation of additional hazardous wastes such as heavy metals, sludge, and used or waste materials occurs as part of Tinker AFB operations. Tinker AFB operates as a large quantity generator of hazardous wastes and may store hazardous waste for up to one year. When such resources are improperly used they can threaten the health and well-being of wildlife species, botanical habitats, soil systems, water resources and people.

To protect habitats and people from inadvertent and potentially harmful releases of hazardous substances, the DoD has dictated that all facilities develop and implement Hazardous Waste

Management Plans or Spill Prevention and Response Plans. Also, the DoD has developed the Environmental Restoration Program (ERP), intended to facilitate thorough investigation and cleanup of contaminated sites located at military installations. These plans and programs, in addition to established legislation (e.g., Comprehensive Environmental Response, Compensation, and Liability Act [CERCLA] and Resource Conservation and Recovery Act [RCRA]) effectively form the “safety net” intended to protect the ecosystems on which most living organisms depend. DoD has also implemented storm water requirements under Section 438 (42 USC § 17094) of the Energy Independence and Security Act to maintain the hydrologic functions of a site and mitigate the adverse impacts of storm water runoff, which may contain hazardous materials or wastes, from DoD construction projects (DoD 2010).

3.3.2 Existing Conditions

3.3.2.1 Hazardous Materials

Tinker AFB

Hazardous materials are utilized to perform and support the mission operations of Tinker AFB. The Hazardous Materials Management Program (HMMP) manages the procurement and use of hazardous materials at the base. The HMMP functions through the Hazardous Materials Pharmacy, which consists of a decentralized Hazardous Materials Pharmacy Cell and a hazardous materials electronic tracking system, the Hazardous Material Management System (HMMS). The HMMS database tracking system performs the following automated functions:

- Tracks the training, exposure, inventory, and personal protective equipment
- Dispenses hazardous materials according to units of use
- Serves as the central issue point for just-in-time control and issue
- Creates online Material Safety Data Sheets (MSDS)
- Maintains hazardous materials control by authorized user, zone and task

The tracking system provides the data necessary to meet reporting requirements, assess processes for pollution prevention opportunities and measure success in minimizing hazardous materials usage (Tinker AFB 2009).

Proposed Project Locations

Chemicals used in the cleaning line process include various solvents and other chemicals to remove paint, rust, scale, carbon, grease, and other buildup on engine parts. Chemicals currently used include CeeBee A-7x7, CeeBee J84, CeeBee J3, CeeBee C-623, and Cee Bee A-477. Chemicals used for the cleaning line may change based on manufacturer availability; however, the type and purpose of chemicals used remain unchanged. Cleaning line operations conducted in B3001 and B3221 expose personnel to some hazardous materials (e.g., solvents). Operations conducted in B3001 and B3221 follow all standard procedures outlined by the HMMP and HMMS for hazardous materials. Several hazardous materials storage sites are within B3001 and B3221 (Figure 3-1).

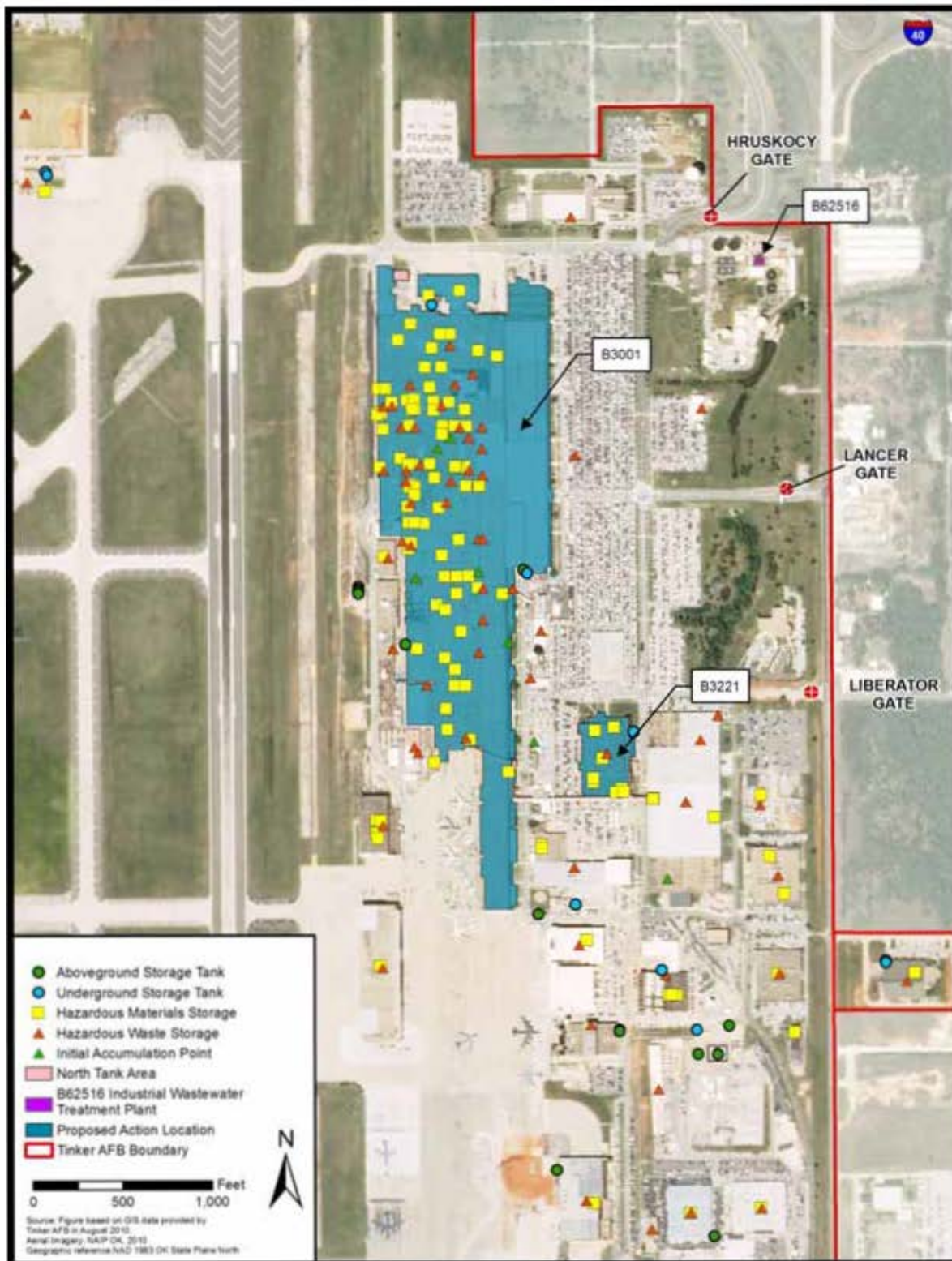


Figure 3-1. Hazardous Materials and Wastes

3.3.2.2 Hazardous Waste Generation and Accumulation

Tinker AFB

Tinker AFB is permitted as a large-quantity hazardous waste generator and holds a Part B permit for its hazardous waste storage facility (HWSF; located in B810) (Tinker AFB 2009). The HWSF permit was issued by DEQ with an effective date of July 2001 (Tinker AFB 2009). DEQ serves as the primary oversight agency for RCRA compliance in Oklahoma. Hazardous wastes at the base are managed in accordance with the most recent hazardous waste management instruction guidelines (RCRA, AFI 32-7042, Tinker AFB Part B permit, and Tinker AFB Instruction 32-7004). Complying with federal and state rules, regulations, permits, and instructions is mandatory for actions relating to hazardous waste on the installation. The purpose of the guidelines is to ensure safe and effective collection, handling, and disposal of hazardous waste on the installation in a manner that complies with applicable DoD and USAF regulations, and federal and state laws (Tinker AFB 2005b).

The largest volume of hazardous waste at the base is generated by aircraft and jet engine maintenance and overhaul activities. These activities include the following:

- Preparation of aircraft skins and structural members
- Paint removal and application, degreasing, metal etching and carbon removal of engines
- Abrasive blasting

Conducting these activities requires the use of large quantities of solvents and the generation of dust and liquid wastes. Other hazardous wastes contributing to this waste stream include petroleum products and waste, hydraulic fluid, and antifreeze.

Another source of waste generated at Tinker AFB results from RCRA corrective actions on past contaminated sites and remediation of National Priorities List (NPL) sites on the base. These wastes consist of solvent-, hydrocarbon-, and metal-contaminated soil and debris removed during remediation projects and are considered CERCLA wastes. Operational activities such as wastewater treatment and vehicle, building, grounds maintenance also generate hazardous wastes. Other hazardous waste at Tinker AFB is generated from remodeling or demolition of older buildings. Due to the age of certain buildings on base, there is a potential for hazardous building materials such as asbestos and lead-based paint to exist.

More than 4,000 tons of hazardous wastes are produced on Tinker AFB annually. Hazardous wastes are accumulated at the site of generation in initial accumulation points (IAPs) located throughout the base (Tinker AFB 2009). In some areas, collection points (e.g., hazardous waste storage; see Figure 3-1) are used to accumulate wastes during work shifts; the wastes are then transferred to an appropriate IAP at the end of the work shift (Tinker AFB 2009). Waste-staging areas are used for some locations where wastes from multiple IAPs are staged for pick up and transfer to one of two accumulation points (APs), located in B809 and B2125 (Tinker AFB

2009). These containers are tracked from the issuance of an empty container through disposal of the container using the HMMS.

B809 is the largest of the APs and processes the majority of containerized hazardous waste from the IAPs for transfer to the treatment, storage, or disposal facility (TSDF). The TSDF is located in B810 and is operated by the Defense Reutilization and Marketing Office. The role of the TSDF is limited to conforming storage (Tinker AFB 2009). B810 and B811 temporarily house hazardous waste for up to one year (Tinker AFB 2005b). Serialized accumulation containers for nonbulk hazardous waste are issued to waste generators and picked up when full (Tinker AFB 2009). Profiling is completed using either generator knowledge or laboratory analysis to identify and quantify the chemical constituents of the waste for proper treatment and disposal. Containers are then shipped off site for disposal.

There are three areas on Tinker AFB where noncontainerized waste is accumulated in APs. The industrial wastewater treatment plant accumulates dewatered hazardous waste sludge in a roll-off bin that is collected by a contractor and taken to an appropriate TSDF (Tinker AFB 2009). B3125 contains an AP where drums are rinsed and crushed, aerosol cans are punctured and crushed, and blast media wastes are accumulated (Tinker AFB 2009). The cleaning line in B3001 includes hazardous waste tanks, which are only used when there is a malfunction in the process line (Tinker AFB 2009).

Proposed Project Locations

B3001 was originally constructed between 1942 and 1943; however, in 1984 a fire that originated on the building's roof grew to include the majority of the building's interior, including the location of the chemical cleaning line. Heavy-metal dust generated from the fire is present throughout the building and may present a hazard to personnel if dust is disturbed during renovation or construction activities. Heavy-metal dust is known to occur in the area of the chemical cleaning line; however, horizontal surfaces (e.g., building framing infrastructure) that have been cleaned for projects since 2002 would likely be free of heavy-metal dust due to cleaning procedures addressing the known presence of such dust. The interior of the building has been refurbished since the 1984 fire and is therefore not likely to contain large amounts of asbestos or lead-based paint; however, asbestos may be present in the insulation material of some chemical tanks. Materials (e.g., chemical residues and deposits) from the floor where overflow tanks spill onto may also include hazardous wastes.

Hazardous wastes are generated by various operations in B3001 and B3221; operations follow all standard procedures outlined by the HMMP and HMMS for hazardous wastes. Several hazardous wastes storage sites are located in B3001 and B3221 (Figure 3-1).

3.3.2.3 Fuel Storage

Tinker AFB

The fuels and materials stored and handled in bulk at the base include aviation fuels, such as jet propellants (JP-5 and JP-8) and pulverized fuel (PF-1); JP-10 (missile fuel); motor gasoline (Mogas; automotive gasoline); diesel fuel; biodiesel fuel; No. 2 heating oil; PD-680 (solvent); and deicing fluid. Conoco supplies JP-8 fuel to Tinker AFB through a 6-inch-diameter supply line that enters the northern section of the base and continues to the main tank farm (Tinker AFB 2005b). Tanker trucks are used as a backup to deliver JP-8, which is dispensed to aircraft either from a refueler vehicle (R-11) or directly through hydrants located on the aprons on the western, southern, and eastern sides of the airfield (Tinker AFB 2009).

Various fuels at the base are also stored in ASTs and USTs. Releases from ASTs and USTs (i.e., spills, overfill, and leaks) can cause fires or explosions that threaten human safety and can contaminate soil and groundwater that threaten human health. The main goal of the base's storage tank program is to protect groundwater and soil from contamination by ensuring the following:

- ASTs meet all applicable requirements for leak testing and prevention and for responding to, reporting, and cleaning up spills, including complying with EPA regulations regarding Spill Prevention Control and Countermeasures plans.
- New USTs (including piping) are designed and constructed to provide corrosion protection, release detection, spill and overfill prevention, proper installation, and secondary containment.
- All existing USTs (i.e., any regulated UST installed before 22 December 1988) are upgraded to meet the standards for new USTs (Tinker AFB 2005b).

An aggressive investigation of abandoned and active USTs at Tinker AFB began in September 1985. Eighty-eight active tanks and 38 abandoned tanks were identified and located. Most of those tanks were found in the vicinity of B3001 and in the north-central portion of the base near B201, B210 and the B290 Fuel Farm.

In coordination with the Oklahoma Corporation Commission (OCC), Tinker AFB began release investigations at 26 UST sites on 31 July 1999. Tinker AFB has completed most of the investigations and has determined the nature and extent of contamination at each UST site; several of those sites are in active remediation. Currently, 15 of the sites have been closed or deactivated in accordance with OCC regulations that were in effect prior to 1 September 1996. The previous rules categorized UST sites for remediation based on generic contaminant levels in soils and groundwater. On 1 July 1996, the OCC issued rules that classify sites for remediation based on risk to human health and the environment. The current process is referred to as the Oklahoma Risk-Based Corrective Action Program. Eleven sites are still open and are in remediation or have been recommended for case closure. In addition, two UST removals were performed in 1998, and tank closure reports were submitted to the OCC in December 1998 for each site. Tinker AFB currently maintains 36 active USTs and 90 active ASTs (Tinker AFB 2009).

Proposed Project Locations

Two ASTs and one UST are located near the south and east sides of B3001 (Figure 3-1). No USTs or ASTs are known to have been installed or constructed in B3221; one UST is installed next to B3221 on the northeastern side of the building (Figure 3-1). In addition, five USTs are known to have been installed at B3001 (identified as Site No. ST003 North Tank Area on Figure 3-2). All tanks at that site have been removed or cleaned and have been abandoned in place (Tinker AFB 2004b). Long-term monitoring is currently in place and site closure is anticipated in 2028 (Tinker AFB 2004b).

3.3.2.4 Groundwater Contamination

Tinker AFB

Tinker AFB has established a basewide groundwater sampling program to obtain depth-to-water and depth-to-product measurements semiannually from approximately 1,300 monitoring wells, pumping wells, and piezometers (a small-diameter observation well used to measure groundwater pressure). The groundwater contamination characterized to date is generally limited to the base boundaries. Groundwater at Tinker AFB is evaluated and monitored in areas where solvents or other hazardous materials may have been disposed of and have impacted groundwater. Three consolidated groundwater management units (GWMU)—identified as the Northwest, East and Southwest GWMUs—are located within the boundaries of Tinker AFB. The purposes of the GWMUs are to define areas to facilitate investigation and monitoring of groundwater for contaminants, principally solvents, metals and fuel that may originate from a variety of localized sources. The sources include several Installation Restoration Program (IRP) sites and non-IRP sites at Tinker AFB. Remediation actions in place include pump-and-treat systems, monitored natural attenuation, and interim controls.

Soil vapor at Tinker AFB results from the evaporation of petroleum products, solvents, or other hazardous materials remaining in the unsaturated soils found below the ground surface (above groundwater level). Vapor intrusion assessments were recently performed to assess the potential for soil vapor intrusion of subsurface contaminants volatilized from soil and/or groundwater into overlying buildings at various areas across Tinker AFB. The assessment preparers determined that the following buildings have a potential for vapor intrusion condition to exist: 200, 220, 240, 255, 267, 296, 2210, 2211, 3001, 3105, 3117, 3123, 3125, 3221, 3225, 3228, 3234, 3307, 3703, 3706, 3707, 3708, and 3761 (Tinker AFB 2011a). However, the assessment concluded that vapor intrusion is likely to be a rare occurrence at Tinker AFB because of the clay-rich soils underlying most of the buildings (Tinker AFB 2011a).



Figure 3-2. Environmental Restoration Program Sites

Proposed Action Area

The project area occurs within the OT001 B3001 groundwater site and a small portion of the East GWMU area (see Figure 3-2). The principal chemicals of concern for Site No. OT001 include fuels and chlorinated solvents, including trichloroethene (TCE). TCE, perchloroethene (PCE), and hexavalent chromium concentrations exist under most or all of the buildings in the area (Tinker AFB 2010a).

In 1994, operation of a groundwater extraction and treatment system was begun for Site No. OT001. The system was designed to pump contaminated water to a treatment plant that processed 216,000 gallons of contaminated water per day from the Site No. OT001 plume, removing pollutants to drinking water standards; the decontaminated water was recycled back to B3001 for use in industrial processes (Tinker AFB 2004b). The groundwater extraction and treatment system is currently inactive and is being evaluated to determine if the system is adequately treating the contaminated area, or if another approach is needed for treatment.

An additional operable unit of the B3001/Soldier Creek NPL Site No. OT001 pertinent to the proposed project is Site No. ST003 North Tank Area. Located at the northwestern corner of B3001, this site housed five USTs constructed or installed between 1943 and 1958 (Tinker AFB 2004b). All tanks have been removed or cleaned and abandoned in place (Tinker AFB 2004b). Cleanup operations began in 1991 with long-term monitoring currently in place; site closure is anticipated in 2028 (Tinker AFB 2004b).

3.3.2.5 Environmental Restoration Program

Tinker AFB

The Secretary of Defense established the Defense ERP in 1981 to investigate and remediate hazardous waste sites at DoD facilities. The USAF subsequently established its ERP to locate and investigate hazardous waste sites on its installations; these sites are termed IRP sites. The ERP execution strategy is to protect human health and the environment and satisfy legal agreements. In addition to IRP sites, two additional types of restoration sites, Military Munitions Response Program (MMRP) and Compliance Restoration Program (CRP), have been incorporated into a new program referred to as *One Cleanup*. MMRP was established in 2002 under the Defense ERP to address unexploded ordnance, discarded military munitions and munitions constituents on current and former defense sites to address the potential explosives safety, health, and environmental issues caused by past DoD munitions-related activities. CRP sites were defined by a new policy that resulted in certain sites originally addressed under the Environmental Compliance Program or with no restoration work previously performed and not previously eligible for cleanup under the Defense Environmental Restoration Account becoming eligible for integration into the IRP. Fully restored and remediated sites under the One Cleanup program present few constraints to future on-base development; however, the implementation of land use controls may be required. Land use controls are physical, legal, or administrative mechanisms that restrict or limit access to contaminated property to promote beneficial land uses and to protect human health and the environment.

A total of 40 IRP sites including National Priorities List sites (operable units), landfills, industrial waste pits, fire training areas, radioactive waste disposal sites, disposal areas, and groundwater contamination sites have been identified on Tinker AFB. Of the 40 IRP sites, 24 have reached site closeout with regulating authorities while the remaining 16 sites have a remedy in place (Scott Bowen, personal communication February 2011). Of these 16 remaining sites, 3 sites are within the jurisdiction of EPA Region 6 and managed under CERCLA, and 13 sites are under the jurisdiction of the DEQ and managed under RCRA. Ten of the closed IRP sites and nine of the active IRP sites are RCRA solid waste management units. Although 24 of the IRP sites have reached site closeout, three of the RCRA sites have only completed case closures for fuel releases from UST releases regulated by the Oklahoma Corporation Commission (OCC) Petroleum Storage Tank Division (Tinker AFB 2010e).

In addition to the IRP sites, 13 CRP sites are located on Tinker AFB. The CRP sites will require additional site investigations and studies before remedial responses can be proposed and implemented (Tinker AFB 2010e). Five additional sites on Tinker AFB have been proposed for inclusion in the Air Force MMRP for additional evaluation and possible remedial action.

Proposed Project Location

B3001 is identified as an operable unit of the B3001/Soldier Creek NPL site, B3001 IRP Site No. OT001, which consists of the 1-mile-long industrial complex and its surrounding areas (Figure 3-2) (Tinker AFB 2004b). Subsurface concrete-lined pits and trenches were used in B3001 between the 1940s and 1970s to remove solvents and wastewater byproducts from the building's interior. These pits and trenches leaked and allowed contaminants to enter the underlying soil; over time, these contaminants have spread to cover about 220 acres to a maximum depth of 175 feet, reaching through the upper and lower saturated zones of the Garber-Wellington aquifer (Tinker AFB 2004b). The primary contaminants in the Site No. OT001 plume are trichloroethylene, chromium, benzene, tetrachloroethene, lead, and nickel (Tinker AFB 2004b). In addition to Site No. OT001, the southernmost portion of B3001 overlies the East Groundwater Management IRP Unit (Figure 3-2). Because of their location, these sites present a possible risk of exposure to soil vapors within B3001.

3.4 Safety

3.4.1 Definition of Resource

The primary safety concern with regard to a military aircraft activity and the potential for aircraft mishaps (i.e., crashes), which may be caused by mid-air collisions with other aircraft or objects, weather difficulties, or on-ground collisions between aircraft. In addition, the occupational safety of personnel working in B3001 is a concern due to the noise generated by the cleaning line equipment and the fumes from the chemical solvents used in the cleaning line process; the facility must have adequate ventilation of the building, space for operations and cleaning activities, equipment storage and operations, environmental controls, and fire safety and suppression systems.

The proposed project site is located along the flightline, east of the runway and is not located in either clear zones or accident potential zones associated with Runways 17/35 or 12/30; therefore, safety issues related runway protection zones are not evaluated for the proposed project.

3.4.2 Existing Conditions

3.4.2.1 Proposed Project Locations

The chemical cleaning line in B3001 was initially constructed between 1942 and 1943 as part of the Douglas Cargo Aircraft Plant during the World War II efforts to produce C-47s for the Army. The building has been identified as the largest building in Oklahoma. Operations within the building shifted in 1978 when a new cleaning line was installed in the same location as the current chemical cleaning line. The cleaning line was rebuilt after being heavily damaged in a large building fire in 1984. B3001 is currently used as headquarters for the OC-ALC, and houses facilities for the 76th Maintenance Wing to conduct overhaul, repair, and test activities for aircraft fuel control accessories.

Cleaning line operations conducted in B3001 and B3221 expose personnel to some hazardous materials (e.g., solvents). Operations conducted in B3001 and B3221 follow all standard procedures outlined by the HMMP and HMMS for hazardous materials. MSDSs are maintained on site for all hazardous materials and chemicals retained on site and used in the chemical cleaning process. Furthermore, personnel regularly attend safety briefs and are trained on proper emergency response and usage of emergency spill kits retained on site.

Cleaning operations for aircraft parts conducted in B3001 include the use of volatile substances (e.g., solvents, steam-generating chemical tanks), resulting in the emission of air pollutants. As mentioned in the Section 3.1, Air Quality, and Section 3.3, Hazardous Materials and Wastes, B3001 and B3221 are located above a groundwater contamination site and the risk exists for exposure to soil vapors. Proper indoor air ventilation systems assist in removing fumes and pollutants from operations within B3001 and B3221; however, individual tanks in the B3001 cleaning line are not served by ventilation hoods but rather the cleaning line area in general is ventilated.

Regarding antiterrorism/force protection (AT/FP) concerns, B3001 and B3221 are considered to be within a controlled access area and additional AT/FP considerations are not required (Tinker AFB 2010b).

3.5 Socioeconomics

3.5.1 Definition of Resource

Socioeconomics can generally be described as the interrelationship between the basic attributes and resources associated with the human environment, particularly population and economic activity. Human population is affected by regional birth rates, death rates, and overall migration. Economic activity includes factors related to the supply of and demand for goods and services, such as employment, personal income, and commercial and industrial growth. Impacts on these

two fundamental socioeconomic indicators can influence other socioeconomic components such as housing availability and the provision of public services. Socioeconomic data in this section are presented for the Oklahoma City region to provide a brief summary the workforce that would be affected by the Proposed Action.

3.5.2 Existing Conditions

3.5.2.1 Oklahoma City

Oklahoma City is the largest city in the state of Oklahoma, with a 2008 estimated population of 544,147 (U.S. Census Bureau 2008). According to the U.S. Census Bureau, Oklahoma County had an estimated total labor force of approximately 334,205 individuals 16 years of age and older in 2008 (U.S. Census Bureau 2008). Oklahoma County has a fairly diverse employment sector, with various occupational categories as top employers. In 2008, the leading occupational categories included *educational services, health care, and social assistance* (69,713); *retail trade* (37,691); *professional, scientific, and technical* (35,485); *arts, entertainment, recreation, accommodation, and food services* (29,737); and *finance, insurance, real estate, rental, and leasing* (26,539) (U.S. Census Bureau 2008). The USAF is a major contributor to the economy of Oklahoma City. According to the Greater Oklahoma City Chamber of Commerce (2010), the top five employers in the Oklahoma City Area are:

- the State of Oklahoma
- Tinker AFB
- University of Oklahoma – Norman Campus
- INTEGRIS Health, and
- Federal Aviation Administration Mike Monroney Aeronautical Center

For the employed population of Oklahoma County, approximately 16 percent are employed by the government (U.S. Census Bureau 2008).

U.S. Bureau of Labor *Statistics Local Area Unemployment Statistics* data for Oklahoma City show an increase in unemployment between 2008 and 2009, from 3.7 to 5.9 percent (U.S. Bureau of Labor Statistics 2010).

3.5.2.2 Tinker AFB

Today, with approximately 27,000 military and civilian employees, Tinker AFB is the largest single-site employer in Oklahoma (Tinker AFB 2010c). The installation has an annual statewide economic impact of \$3.4 billion, creating an estimated 30,865 secondary jobs (Tinker AFB 2010c). Approximately 7,400 military and civilian personnel are employed by the 76 Maintenance Wing. All personnel involved in support of the chemical line are from the 76 Maintenance Wing. Personnel that are involved in cleaning line operations in B3001 include 15 day workers with 2 work leaders on day shift and an additional 8 workers on swing shift. Personnel involved in the paint stripping line at B3221 include 6 workers on day shift and

3 workers on swing shift. The current workload of the chemical cleaning line is approximately 60,000 – 70,000 parts per year.

3.6 Sustainability

3.6.1 Definition of Resource

EO 13514 was issued on 4 October 2009 to focus the attention of federal agencies on promoting the establishment of an integrated system of development that promotes environmental sustainability by the federal government and emphasizes the reduction of GHG emissions. The federal government is taking actions to reduce GHG emissions through means such as streamlining infrastructure to minimize vehicle use and vehicle emissions (i.e., idling), and reducing facility consumption of energy by implementing energy conservation projects. GHG emissions are discussed in Section 3.1, *Air Quality*.

The U.S. Green Building Council has developed the Leadership in Energy and Environmental Design (LEED) program to provide building owners and operators a concise framework for identifying and implementing practical and measurable green building design, construction, operations, and maintenance solutions (U.S. Green Building Council 2010). The U.S. Green Building Council's LEED is a third-party certification program and the nationally accepted benchmark for the design, construction, and operation of high-performance green buildings (U.S. Green Building Council 2010). The USAF has taken LEED guidelines into account during the design and planning of the proposed project to assist in meeting recommendations outlined by EO 13514, as well as to benefit from reduced operating costs, increased asset value, reduced waste sent to landfills, conservation of energy and water, healthier and safer facilities for occupants, reduction of GHG emissions, and to serve as a demonstration of the USAF's commitment to environmental stewardship and social responsibility.

3.6.2 Existing Conditions at the Proposed Project Location

The existing cleaning line at B3001 is outdated and inefficient, and incurs approximately \$3 million per year in utility costs (Tinker AFB 2010a). The current cleaning line consumes a large amount of energy, water, and chemical resources, resulting in an inefficient system that is not compliant with EO 13514.

The existing cleaning line does not provide process control and is configured in such a way that results in inefficient and excessive use of resources including process chemicals and utilities including water and energy for heating, cooling, and ventilation systems. The cleaning line also generates a large amount of wastewater that is treated by the industrial wastewater plant (IWTP) on base. Current utility costs are presented in Table 3-2.

Table 3-2. Current Annual Utility Costs

Description	Unit	Usage (Current)	Cost in \$ (Current)
Blowers	kWh	666,566	33,328
Exhaust Fans	kWh	1,045,594	52,280
Building Heating	Mlbs	23,621	136,055
Process Heating	Mlbs	26,781	154,257
Building Cooling	Ton AC	460,689	9,674
Condensate	kGal	4,721	71,287
Water	kGal	160,396	130,883
Industrial Waste Water	kGal	160,396	2,421,974
Total			\$3,009,688

Source: Tinker AFB 2010b

Notes: Ton AC = tons of air conditioning (12,000 British thermal units [btu] per hour or 3.517 kilowatt-hours)
kWh = kilowatt-hours, kGal = 1,000 gallons, Mlbs = 1,000,000 pounds

3.7 Water Resources

3.7.1 Definition of Resource

Water resources analyzed in this EA include surface and groundwater resources, including the quality and availability of surface and groundwater. Surface water resources comprise lakes, rivers, and streams and are important for a variety of reasons including economic, ecological, recreational, and human health.

Groundwater comprises the subsurface hydrologic resources of the physical environment and is an essential resource in many areas; groundwater is commonly used for potable water consumption, agricultural irrigation, and industrial applications. Groundwater properties are often described in terms of depth to aquifer, aquifer or well capacity, water quality, and surrounding geologic composition. (Potential impacts on or resulting from contaminated groundwater are addressed in Section 4.3, Hazardous Materials and Wastes.)

3.7.2 Existing Conditions

3.7.2.1 Regional Setting

Surface Water

Oklahoma County's landforms drain into the North Canadian River, which runs west to east through the county. The northern portion of the county drains into the Crutcho Creek drainage basin and into the North Canadian River, and the southern portion drains into the Elm Creek and Hog Creek drainage basins and into the South Canadian River; both rivers are headwaters for the Arkansas River. The entire county is part of the Arkansas River Basin.

Several drainage corridors traverse Oklahoma County close to Tinker AFB, including Brock Creek, East Elm Creek, Crutcho Creek, West Hog Creek, the East Fork and West Fork of

Wildhorse Creek, Bluff Creek, Walnut Creek, and Soldier Creek. Surface waters on Tinker AFB occur in three primary drainage basins, one of which drains to the north (Crutch Creek with Kuhlman and Soldier Creek tributaries) and two to the south (East Elm Creek and West Hog Creek) (Tinker AFB 2007).

Surface drainage at Tinker AFB occurs in three primary drainage basins: the Crutch Creek drainage basin, Elm Creek drainage basin, and Hog Creek drainage basin. Most of the land associated with Tinker AFB is drained by the Crutch Creek drainage basin, which flows to the north into the North Canadian River. The Elm Creek and Hog Creek drainage basins flow to the south of the base into the Little River, which forms a confluence with the South Canadian River (Tinker AFB 2007).

On-base, open-flowing waters total approximately 8 linear miles. Most base creek flows are the result of storm water runoff, though portions of the creeks are recharged from groundwater. Storm water runoff is collected by various diversion structures and discharged into surface streams (Tinker AFB 2007).

No significant point-source industrial discharges currently are made into any waterway on Tinker AFB. In 1996, the base's industrial wastewater treatment plant and sanitary treatment plant discharges were rerouted to Oklahoma City's publicly owned treatment works. This eliminated flows of 1.3 million gallons per day to the on-base portion of Soldier Creek (i.e., East Soldier Creek) (Tinker AFB 2002).

Groundwater

The aquifers that underlie Oklahoma County include both ephemeral (short-lived) and perennial (year-round) aquifers. The most important source of potable groundwater in the Oklahoma City metropolitan area is the Central Oklahoma Aquifer system. This aquifer extends under much of central Oklahoma and includes water in the Garber sandstone and Wellington Formation, the overlying alluvium and terrace deposits, and the underlying Chase, Council Grove, and Admire groups. The Garber sandstone and the Wellington Formation portions of the Central Oklahoma Aquifer system are referred to commonly as the Garber-Wellington Aquifer; this is considered to be a single aquifer because these units were deposited under similar conditions. Many of the best-producing water wells in the county are in this zone. On a regional scale, the aquifer is confined above by the less permeable Hennessey Group and below by the Late Pennsylvanian Vanoss Group. The regional dip of these formations is generally to the west (Parkhurst et al. 1993). Across the county, water can sometimes be found in shallow, thin, discontinuous perched zones located above the aquifer. Most water from the Garber-Wellington Aquifer is of sufficient quality to be used for most industrial, agricultural, and domestic purposes.

The primary drinking water supply source for Tinker AFB is a system of wells on Tinker AFB. There are 22 operational wells that obtain water from the Garber-Wellington Aquifer, which is part of the larger Central Oklahoma Aquifer. The wells operate at approximately 75 percent of rated capacity, producing approximately 2.2 million gallons per day (Tinker AFB 2010d). A secondary drinking water source is provided by the Oklahoma City Water Department, via two metered connections, that supplies approximately 30,000 gallons per month.

Industrial operations, individual homes, farm irrigation, and small communities not served by a municipal distribution system with a surface water source depend on the Garber-Wellington Aquifer. Communities presently depending on surface supplies, such as Oklahoma City, Midwest City and Del City, maintain wells tapping the Garber-Wellington Aquifer as a backup water supply in the event of drought.

The primary subsurface water zones identified at Tinker AFB include the Hennessey water-bearing zone, the upper saturated zone (formerly the “perched” zone), the lower saturated zone (formerly the “top of regional” and “regional” aquifers), and the producing zone. Tinker AFB is located in a recharge area for these water-bearing zones; groundwater is derived primarily from precipitation and from infiltration of surface streams. Tinker AFB lies within the recharge area of the Garber-Wellington Aquifer. Regional groundwater flow under Tinker AFB ranges in direction from west/northwest to southwest, depending on location, and has a gradient between 10 to 30 feet per mile (Tinker AFB 2007). The Hennessey water-bearing zone overlies this aquifer in the southwestern portion of the base, but it is not part of the Garber-Wellington Aquifer. Groundwater at Tinker AFB is found under either water table or confined conditions. The depth to water ranges from a few feet to about 70 feet depending on the local topography. Across Tinker AFB, water can sometimes be found in shallow, thin, discontinuous perched zones above the aquifer.

Wastewater

Tinker AFB no longer operates a wastewater treatment plant. Industrial wastewater on Tinker AFB is treated at the IWTP in B62516 on the eastern side of Tinker AFB (Figure 3-1). Forty-six sanitary wastewater lift stations and associated force mains are located throughout the main Tinker AFB area to maintain adequate pressure and flow through the sewer lines. Industrial wastewater on the eastern side of the base (including B3001 and B3221) is pretreated at the IWTP prior to being discharged into the Oklahoma City sanitary sewer system. Tinker AFB’s industrial wastewater is regulated under its industrial discharge permit with the Oklahoma City Water and Wastewater Utilities Department (Tinker AFB 2009). Industrial waste includes oil, grease, and other contaminants that collect into aqueous streams (e.g., contents from chemical cleaning line processes). The industrial wastewater treatment plant receives and treats approximately 600,000 gallons per day of wastewater before releasing it into the Oklahoma City municipal wastewater treatment plant (Tinker AFB 2010d). Currently, the residual oily sludge from the industrial wastewater treatment processes is not filtered and is disposed of as hazardous waste.

Tinker AFB uses a combination of natural and constructed features (e.g., gutters, culverts, pipes) to convey storm water through the storm water drainage system. Tinker AFB’s OC-ALC Plan 19-2, *Spill Prevention and Emergency Response Plan for Hazardous and Extremely Hazardous Material and Spill Prevention Control and Countermeasures Plan* (Tinker AFB 2004a), presents specific procedures for preparing for and responding to inadvertent discharges of oil or releases of hazardous substances at the base.

In 2002, Tinker AFB developed a Storm Water Pollution Prevention Plan (SWPPP) to comply with the conditions of the Multi-Section General Permit for Storm Water Discharges Associated with Industrial Activities (Permit Number GP-00-01) (Tinker AFB 2002). The SWPPP is noted as a supporting plan in OC-ALC Plan 19-2. The SWPPP provides basewide and facility-specific best management practices (BMPs) to reduce pollutants in storm water discharges from the base. BMPs for Tinker AFB include the following:

- Source controls
- Management practices
- Preventive maintenance
- Spill prevention and response
- Erosion and sediment controls
- Identification of storm water pollution prevention personnel

In addition, the DoD has implemented storm water requirements under Section 438 (42 USC §17094) of the Energy Independence and Security Act to maintain the hydrologic functions of a site and mitigate any adverse impacts of storm water runoff generated by DoD construction projects at such a site. Section 438 requires federal facility projects exceeding 5,000 sf to “maintain or restore, to the maximum extent technically feasible, the predevelopment hydrology of the property with regard to the temperature, rate, volume, and duration of flow” (DoD 2010).

3.7.3 Existing Conditions at the Proposed Project Location

The approximate direction of groundwater flow in the Garber-Wellington Aquifer is south and southwest across the southern half of the base and west to northwest across the northern half. Shallow groundwater may discharge into surface streams or be recharged by streams; both situations occur at Tinker AFB along Crutcho Creek and Soldier Creek. In contrast, water in the Hennessey water-bearing zone generally flows to the northeast toward Upper Crutcho Creek from higher topographic areas along the southern boundary of the base (Tinker AFB 2007). However, some water from the Hennessey water-bearing zone flows northwesterly into the main branch of Crutcho Creek. Additionally, much of the water in this zone enters Tinker AFB from the west under Sooner Road (off the Oklahoma City Anticline) and flows eastward to Crutcho Creek. On Tinker, several other stream segments are also recharged by this groundwater and flow is generally semiradial.

Cleaning line tanks in B3001 are refilled with chemical solution several times per day or are constantly refilled with water, depending on the process for each tank. Constant refilling of the tanks results in steady overflow of tank contents onto the floor of the cleaning line area; overflow materials drain along the floor into trenches between each row of tanks in the cleaning line area. Heavy buildup of materials such as mineral and chemical deposits occurs on the floor in this area. The overflow solutions ultimately drain into the utility trench in the northwestern corner of the cleaning line system, where the runoff is conveyed to the Tinker AFB IWTP through wastewater utility lines.

THIS PAGE INTENTIONALLY LEFT BLANK

SECTION 4.0 ENVIRONMENTAL CONSEQUENCES

This section evaluates the potential environmental consequences resulting from implementation of the Proposed Action or alternatives. Analyses are presented by resource area, as presented in Section 3, *Affected Environment*.

4.1 Air Quality

4.1.1 Approach to Analysis

The 1990 CAAA require that federal agency activities conform to the SIP with respect to achieving and maintaining attainment of NAAQS and addressing air quality impacts. The EPA General Conformity Rule requires that a conformity analysis be performed that demonstrates that a Proposed Action does not (1) cause or contribute to any new violation of any NAAQS in the area, (2) interfere with provisions in the SIP for maintenance or attainment of any NAAQS, (3) increase the frequency or severity of any existing violation of any NAAQS, or (4) delay timely attainment of any NAAQS, any interim emission reduction, goals, or other milestones included in the SIP for air quality. A conformity review must be performed when a federal action generates air pollutants in a region that has been designated a *nonattainment* or *maintenance area* for one or more NAAQS. *Nonattainment areas* are geographic regions where the air quality fails to meet the NAAQS. *Maintenance areas* are regions where NAAQS were exceeded in the past, and are subject to restrictions specified in a SIP-approved maintenance plan to preserve and maintain the newly regained attainment status. Provisions in the General Conformity Rule allow for exemptions from performing a conformity determination if the total net increase in emissions of individual nonattainment or maintenance area pollutants resulting from implementation of the Proposed Action fall below the significant (*de minimis*) threshold values established in 40 CFR 93.153 (b) (1) and (2).

As of 19 January 2011, the state of Oklahoma does not have any *nonattainment areas* for the NAAQS pollutants (EPA 2011a). At this time the state of Oklahoma does not have a SIP in place for the Oklahoma City area. Therefore, an air conformity analysis will not be required for this Proposed Action.

The air quality analysis presented in this section describes impacts based on current regulations. If regulations change prior to implementation of the Preferred Alternative or Alternative 2, air quality impacts should be reevaluated using the new standards.

To comply with EO 13514, *Federal Leadership in Environmental, Energy, and Economic Performance*, the project has been evaluated for its impact on the federal government's goal to reduce GHG emissions by reducing energy consumption through strategic sustainable development, energy-efficient building design, and environmentally friendly building material selection. The project alternatives have been evaluated for their adherence to the EO and the *Federal Leadership in High Performance and Sustainable Buildings Memorandum of Understanding* referenced within the EO, as it pertains to identifying energy-reduction opportunities and siting considerations.

4.1.2 Impacts

4.1.2.1 Preferred Alternative

Pollutant emissions associated with implementation of the Preferred Alternative Action at Tinker AFB would include construction emissions (i.e., fugitive dust emissions), and combustion emissions from construction-related vehicles traveling to Tinker AFB during the renovation of B3001. However, construction emissions are limited to interior renovation activities only. At this time there are no exterior renovations being proposed under this Preferred Alternative. It is anticipated that the emissions resulting from construction activities would have little to no impact on the ambient air quality concentrations. Implementation of the Preferred Alternative would result in beneficial impacts on operational emissions, as described in the following section.

Construction Emissions

Dust Emissions

Under implementation of the Preferred Alternative, construction dust emissions (i.e., PM₁₀, a criteria pollutant) generated during the repair and renovation of B3001 would be negligible. The repair and renovation of B3001 would involve replacement of the cleaning line in the interior of the building and installation of a rooftop equipment mounting platform over the location of the cleaning line; no additional exterior renovations are planned. Construction dust emissions can vary on a daily basis depending on levels of activity, specific operations, and prevailing meteorological conditions; however, construction under the Preferred Alternative would be contained to the interior of the B3001 or the rooftop of B3001. No ground-disturbing activities would occur; therefore, construction dust emissions are expected to be negligible. The existing building is surrounded by paved areas including the flight line, aircraft taxiways, and parking lots. No unpaved areas are anticipated to be disturbed during construction activities, and these paved areas would be routinely cleaned to minimize airborne debris and dust; therefore, negligible fugitive dust emissions would be generated. PM₁₀ emissions resulting from repair and renovation construction activities associated with the Preferred Alternative would be negligible and would be restricted to the building footprint of B3001.

Combustion Emissions

Combustion emissions associated with construction-related vehicles would be minimal because the number of construction-related vehicles traveling to and from the site during each phase would be minimal; rather, construction-related vehicles would remain onsite during the duration of construction. Therefore, the associated combustion emissions would be negligible and expected to be below *de minimis* levels. Further, as is the case with construction dust emissions associated with the Preferred Alternative, emissions generated by construction-related vehicles would be temporary. It is anticipated that GHG emissions associated with the Preferred Alternative would be negligible during construction activities. The GHG emissions would be a result of construction-related vehicles traveling to and from the site and would result in minimal impacts.

Operational Emissions

Emissions generated by normal day-to-day operations of B3001 would decrease slightly during the proposed modifications, as described under the Preferred Alternative; however, the cleaning line would remain partially in operation during construction activities, and some operations would be shifted to B3221 to maintain current workloads. During implementation of construction activities, replacement of the cleaning line in B3001 would be implemented in phases (Tinker AFB 2010b). As part of the operational planning for the Preferred Alternative, the cleaning operations would continue to accommodate the current workload; at least one process line capable of accommodating long processes and multistep alkaline cleaning would remain operational at any given time. However, parts requiring paint stripping would be redirected to B3221. The relocation of paint-stripping operations to B3221 would not generate any new operational emissions. At this time, no new daily operations would be implemented as a result of the Preferred Alternative. While operations throughput would remain the same, decreases in operational emissions would be anticipated through the use of new, more efficient technology (e.g., cleaning tanks and covers, exhaust and ventilation systems) and removal of aging equipment. More streamlined, efficient cleaning processes would require lower input of resources and would generate fewer excess byproducts than the current system, resulting in overall more efficient operations and lower operational emissions.

Renovation of the cleaning line would not generate new workload. Therefore, emissions are expected to be limited to those that result from existing sources. The improved operational efficiency that would result from implementation of the Preferred Alternative would include the application of sustainable development concepts in the planning, design, construction, environmental management, operation maintenance, and disposal of facilities and infrastructure projects. Implementation of the Preferred Alternative would beneficially impact air quality, reduce energy and water consumption, and improve the efficiency of the cleaning line. In addition, GHG emissions would be expected to decrease due to lower energy use and improved operational efficiency of the cleaning line, resulting in beneficial impacts on GHG emissions.

Implementing the Preferred Alternative would not require any new permitting action, other than initial notification to DEQ for a newly constructed or reconstructed source in accordance with Specific Condition CF1-6 of Tinker AFB's current Title V Permit.

Indoor Air Quality

Construction-Related

During renovation activities, removal of materials may include asbestos-containing materials, including friable asbestos, which could present a risk of exposure to personnel within the building. Consequently, the removal of any such materials may result in the generation of regulated waste. The Occupational Safety and Health Administration prohibits occupation of a work area without respiratory protection if either of the following occur:

- The eight-hour average fiber concentration exceeds 0.1 fibers per millimeter.
- A 30-minute fiber concentration exceeds 1.0 fibers per millimeter.

Neither of these levels is likely to be exceeded during normal building occupation unless heavy damage is inflicted to an asbestos-containing material. No lead based paint or asbestos-containing materials are believed to exist due to the fire that occurred in 1984; however, a limited investigation would be conducted to evaluate roofing materials prior to construction. Regulated waste would be handled and transported off site by a licensed contractor for disposal; therefore, impacts on indoor air quality would be temporary during renovation and no long-term impacts on indoor air quality would occur. Affected roofing materials in B3001 would be tested for asbestos prior to mounting rooftop equipment. Should these materials test positive for asbestos, proper containment and remediation efforts would be conducted. Proper measures would be taken to avoid worker exposure through containment areas, ventilation, and sample collection.

Operations-Related

Cleaning line operations conducted in B3001 would not change due to the Proposed Action; therefore, existing emission sources would remain the same. However, under the Preferred Alternative, new equipment would include covered tanks and improved exhaust and ventilation systems that would minimize the amount of exhaust and other toxic emissions into the general environment. Worker exposure to chemical fumes would be reduced following replacement and renovations due primarily to these improvements proposed for the cleaning line tank configuration and ventilation system. Therefore, implementation of the Preferred Alternative would result in long-term beneficial impacts on indoor air quality.

4.1.2.2 Alternative 2: Simultaneous Replacement of All Chemical Cleaning Line Components

Construction and Operational Emissions

Long-term impacts resulting from the implementation of Alternative 2 would be the same as those described for the Preferred Alternative. Temporary impacts would be similar to those described for the Preferred Alternative; however, proposed construction activities would occur over a shorter period. Construction-related emissions, including dust and combustion, would be negligible. Operational emissions, for reasons similar to the Preferred Alternative, would remain the same and below *de minimus* levels for pollutants.

Indoor Air Quality

Similar to the Preferred Alternative, asbestos-containing materials, metals, and chemical residues may be encountered during proposed replacement activities under Alternative 2. Affected building materials would be tested for asbestos prior to demolition activities. Should materials test positive for asbestos, proper containment and remediation efforts would be conducted. Proper measures would be taken to avoid worker exposure through containment areas, ventilation, and sample collection. Therefore, under implementation of Alternative 2, impacts related to indoor air quality would be temporary during proposed activities, and no long-term construction-related impacts on indoor air quality would occur.

For reasons similar to the Preferred Alternative, existing operations-related indoor air emissions would be reduced following proposed activities under Alternative 2 due primarily to improvements to the cleaning line tank configuration and ventilation system that would reduce worker exposure to chemical fumes. However, the beneficial impacts would occur sooner than under implementation of the Preferred Alternative due to a compressed work schedule (non-phased approach). Therefore, implementation of Alternative 2 would result in long-term beneficial impacts on indoor air quality.

4.1.2.3 Alternative 3: No-Action Alternative

If the No-Action Alternative were selected, Tinker AFB would not implement the Proposed Action and replacement of the B3001 cleaning line would not occur. Therefore, operations-related emissions would remain at current levels and impacts on indoor air quality would continue due to the continued operation of inadequate cleaning line ventilation and exhaust systems; conditions would remain as described in Section 3.1, *Air Quality*, and no construction-related impacts would occur.

4.2 Cultural Resources

4.2.1 Approach to Analysis

Cultural resources are subject to review under both federal and state laws and regulations. Section 106 of the NHPA of 1966 empowers the Advisory Council on Historic Preservation to comment on federally initiated, licensed, or permitted projects affecting cultural sites listed or eligible for inclusion on the NRHP.

Once cultural resources have been identified, significance evaluation is the process by which resources are assessed relative to significance criteria for scientific or historic research, for the general public, and for traditional cultural groups. Only cultural resources determined to be significant (i.e., eligible for the NRHP) are protected under the NHPA.

Analysis of potential impacts on cultural resources considers both direct and indirect impacts. Direct impacts may occur by (1) physically altering, damaging, or destroying all or part of a resource; (2) altering characteristics of the surrounding environment that contribute to resource significance; (3) introducing visual, audible, or atmospheric elements that are out of character with the property or alter its setting; or (4) neglecting the resource to the extent that it deteriorates or is destroyed.

Direct impacts can be assessed by identifying the types and locations of Proposed Actions and determining the exact locations of cultural resources that could be affected. Indirect impacts primarily result from the effects of project-induced population increases and the resultant need to develop new housing areas, utility services, and other support functions necessary to accommodate population growth. These activities and the subsequent use of facilities can disturb or destroy cultural resources.

4.2.2 Impacts

The Proposed Action involves the replacement and renovation of the existing cleaning line at B3001; the building itself has been determined to be individually eligible for the NRHP and is a contributing element of the Douglas Cargo Aircraft Manufacturing Historic District (Tinker AFB 2005a). B3221 is not considered a cultural resource; therefore, there would be no cultural resource impacts on B3221 and no additional evaluation of B3221 is presented in this section.

Although the likelihood of discovering significant cultural resources such as archeological deposits would be extremely minimal during the Proposed Action, any such inadvertent discoveries would be processed under Tinker AFB ICRMP Section E.7.3, *Inadvertent Discoveries*, and provisions of applicable law(s) such as NHPA Section 106 (36 CFR 800.13).

4.2.2.1 Preferred Alternative

The Preferred Alternative would involve interior renovations of the cleaning line in B3001 and installation of a rooftop equipment platform for makeup air systems and fume scrubbers. The fume scrubber/fan assemblies would measure approximately 24 feet in length, 12 feet in width, and 9 feet-8 inches in height. There would be no other alterations to the building structure or exterior appearance of the building, and no impacts would occur to character-defining features of B3001.

Per the ICRMP (Tinker AFB 2005a), if proposed actions do not involve “significant interior architectural features and the rehabilitation will not affect the exterior of the building,” the action is considered to have no adverse effect on cultural resources. Although the Preferred Alternative would include the installation of a rooftop equipment mounting platform, there would be no adverse effect on the character-defining features of B3001. A number of rooftop mounted infrastructure units currently exist on B3001, and the integrity of the roof as a character-defining feature would not be compromised. To ensure no adverse effect, all activities would be required to meet the Secretary of the Interior’s *Standards for Treatment of Historic Properties*. Given the building’s height and massing, the rooftop infrastructure would not likely be seen from other locations within the Historic District and would be consistent with existing rooftop infrastructure. Visual aesthetics within the district would not be impacted. Therefore, the Preferred Alternative would result in no adverse effect.

4.2.2.2 Alternative 2: Simultaneous Replacement of all Chemical Cleaning Line Components

Alternative 2 would involve the simultaneous replacement of all components of the B3001 cleaning line, with workload temporarily shifted to B3221 during the replacement activities. Similar to the Preferred Alternative, under Alternative 2 there would be interior renovations of the cleaning line in B3001 and installation of a rooftop equipment mounting platform; therefore, there would be no impacts on character-defining features of B3001.

4.2.2.3 Alternative 3: No-Action Alternative

If the No-Action Alternative were selected, Tinker AFB would not implement the Proposed Action and the B3001 cleaning line would not be replaced. Therefore, there would be no impacts on cultural resources; conditions would remain as described in Section 3.2, *Cultural Resources*, and no construction-related impacts would occur.

4.3 Hazardous Materials and Wastes

4.3.1 Approach to Analysis

Numerous local, state, and federal laws regulate the storage, handling, disposal, and transportation of hazardous materials and wastes; the primary purpose of these laws is to protect public health and the environment. The significance of potential impacts associated with hazardous substances is based on their toxicity, ignitability, and corrosivity. Impacts associated with hazardous materials and wastes would be significant if the storage, use, transportation, or disposal of hazardous substances would substantially increase human health risk or environmental exposure.

4.3.2 Impacts

4.3.2.1 Preferred Alternative

Construction-Related Hazardous Materials and Wastes

Proposed activities under the Preferred Alternative include removal of the following items:

- Piping
- Abandoned chemical tanks
- Tank insulation
- Floor deposits and residues

Tinker AFB Instruction 32-7004, *Environmental Education Training*, would be followed during the removal and disposal of cleaning line tanks and associated equipment. Equipment would be triple-rinsed prior to leaving the cleaning line shop area in order to eliminate concerns of contaminants leaving the project area. Water used in rinsing equipment would be collected by the existing system and treated through the industrial wastewater treatment plant.

All mercury-containing light bulbs and ballasts would be disposed of in accordance with the Universal Waste Rule, and light bulb replacement guidance included in the Tinker AFB Hazardous Waste Management Program.

All chemical residues, including rags used to clean equipment, would be stored in sealed drums and processed as hazardous waste at the existing IAPs in B3001.

No lead-based paint or asbestos-containing materials are believed to exist due to the fire that occurred in 1984 (Personal communication, Roger Feltman, 6 April 2011). A limited investigation would be conducted to evaluate roofing materials prior to construction due to proposed rooftop mounted equipment which would require cutting into the roofing material. Some of these items may contain asbestos (e.g., insulation wrap), lead-based paint (e.g., piping), or other hazardous materials (e.g., chemical residues), resulting in the generation of regulated waste. Regulated waste would be transported off site by a licensed contractor for disposal. The Occupational Safety and Health Administration prohibit occupation of a work area (without respiratory protection) if either of the following occurs:

- The 8-hour average fiber concentration exceeds 0.1 fibers per millimeter
- A 30-minute fiber concentration exceeds 1.0 fibers per millimeter

The Preferred Alternative site is located above areas of soil and groundwater contamination that are a result of the concrete-lined pits and trenches that removed solvents and wastewater byproducts from B3001 between the 1940s and 1970s. A groundwater extraction and treatment system has been constructed to pump contaminated water to a treatment plant to remove pollutants and meet drinking water standards; the water is then recycled to B3001 for reuse in industrial processes (Tinker AFB 2004a). It is unlikely that groundwater quality would be affected by implementing the proposed cleaning line renovations in B3001; however, there are known soil vapor concerns at B3001 from the groundwater contamination beneath B3001. Cutting into the concrete building slab is proposed under this alternative for the installation and renovation of concrete piers that support process tanks; however, cutting is not anticipated to occur deep enough to reach soil beneath the concrete building slab.

All required controls on the handling of hazardous materials and wastes (e.g. heavy-metal dust, asbestos, lead-based paint, chemical residues and deposits), contaminated soil, soil vapor, and for spill prevention and cleanup would be implemented to protect workers from potential exposure to hazardous materials and wastes or soil vapor. Any excavated soils must be characterized for disposal and a Waste Management Plan for the soils must be approved and coordinated through 72 ABW/CEPR. During excavation, if there is any concern that the material may be contaminated, work must be stopped immediately and 72 ABW/CEPR must be called. On-site workers must have hazardous waste operations training and a Health and Safety Plan that addresses the potential for hazardous vapors and mitigation efforts to be taken. Impacts on or resulting from groundwater contamination are anticipated to be negligible under the Preferred Alternative.

Implementation of the Preferred Alternative would not involve any new construction outside of the existing building footprint of B3001; therefore there would be no change in the impermeable surface area of the project site. The Tinker AFB SWPPP and BMPs would be adhered to during construction activities to eliminate potential impacts from storm water runoff (e.g., pollutants in storm water discharges).

Long-term exposure to hazardous materials outside of that required as part of existing cleaning line operations at the Preferred Alternative site would not be anticipated to occur. Because regulated waste would be contained and disposed of according to all applicable standards by a licensed contractor, no impacts related to the exposure to hazardous materials from renovation activities would be anticipated to occur under implementation of the Preferred Alternative.

Operations-Related Hazardous Materials and Wastes

Hazardous materials are a major component of the chemical cleaning line (e.g., solvents). Implementation of the Preferred Alternative would not result in a change in the types of hazardous materials used, but it would greatly reduce chemical consumption and waste. The consumption rate of chemicals for chemical processes would decrease as a result of the improved efficiency of the cleaning line under the Preferred Alternative. Additionally, the Preferred Alternative would provide process control over tanks, a reduction in steam/vapor emissions, and a configuration that would prevent human health hazards from overflow chemicals. Various hazardous materials are utilized for the cleaning line process, and MSDSs are maintained on site for all hazardous materials and chemicals used in the cleaning process in B3001 and B3221. Further, personnel regularly attend safety briefs and are trained on proper emergency response and usage of emergency spill kits retained on site. Safety and spill response protocols would remain in place following implementation of the Preferred Alternative; therefore, safety impacts as a result of onsite hazardous materials would not be anticipated from the operation of the renovated cleaning line.

B3001 currently has hazardous waste tanks on site, which are only used when there is a malfunction in the process line (Tinker AFB 2009). Implementation of the Preferred Alternative would not increase the amount of hazardous materials generated by current operations; instead it is anticipated that renovated process lines and increased efficiency of the cleaning line system would reduce the generation of hazardous wastes from current volumes. Five USTs are known to have been installed at B3001 (identified as Site No. ST003 North Tank Area); no ASTs are located at B3001. All tanks have been removed or cleaned and abandoned in place (Tinker AFB 2004b). No ASTs or USTs are located in B3221. Implementation of the Preferred Alternative would have no impact on hazardous materials and waste storage sites, USTs, or ASTs. Contaminated groundwater plumes exist typically at a depth of 175 feet or shallower within the project area. These plumes do not pose health concerns at this time since the producing zone at Tinker AFB (i.e., depth at which water from supply wells is obtained) is 200 feet or deeper. In addition, there appears to be an aquitard, or hydraulically confining lithologic layer, at approximately 200 feet, which hydraulically separates the producing zone from shallower groundwater in the aquifer at Tinker AFB (Tinker AFB 2007). Therefore, there would be no short-term impacts on or resulting from hazardous materials and wastes; long-term impacts would be beneficial because of the reduced generation of such materials.

4.3.2.2 Alternative 2: Simultaneous Replacement of all Chemical Cleaning Line Components

Construction- and operations-related impacts under Alternative 2 would be the same as those described for the Preferred Alternative. A complete shutdown of all process lines would occur to simultaneously replace components of the existing B3001 cleaning line. The workload would be shifted to B3221, which has existing facilities capable of accommodating a portion of the B3001 cleaning line workload until the replacement in B3001 is complete. Alternative 2 would not likely include generation of hazardous materials (e.g., asbestos, chemical residues) from B3001 during renovation efforts. Similar to the Preferred Alternative, Alternative 2 would not result in a change in the types of hazardous materials used, but it would greatly reduce chemical consumption and waste. A reduction in the consumption rate of chemicals for chemical processes would decrease as a result of the improved efficiency of the cleaning line. Additionally, Alternative 2 would provide process control over tanks, a reduction in steam/vapor emissions, and a configuration that would prevent human health hazards from overflow chemicals. MSDSs are maintained on site for all hazardous materials and chemicals used, and personnel regularly attend safety briefs and are trained on proper emergency response and usage of emergency spill kits retained on site. Safety, handling, and spill response protocols would be transferred to the cleaning line operations within B3221. Additionally, no USTs or ASTs are known to have been installed or constructed at B3221. As such, similar to the Preferred Alternative, implementation of Alternative 2 would have no impact on hazardous materials and waste storage sites, USTs, or ASTs. Therefore, impacts on or resulting from hazardous materials or wastes would not be anticipated under the implementation of Alternative 2.

4.3.2.3 Alternative 3: No-Action Alternative

If the No-Action Alternative were selected, Tinker AFB would not implement the Proposed Action and the B3001 cleaning line would not be replaced. Therefore, conditions would remain as described in Section 3.3, *Hazardous Materials and Wastes*, and could result in adverse impacts since hazardous wastes would continue to be produced and emitted at unnecessarily high levels. No construction-related impacts would occur.

4.4 Safety

4.4.1 Approach to Analysis

If implementation of the Proposed Action would substantially increase the risks associated with health and safety of workers, the public, or the environment, it would represent a significant impact. For example, if an action involved an increase in the use of hazardous materials that would cause the potential of worker exposure to increase significantly, occupational health and safety would be compromised; conversely, beneficial impacts would be those reducing hazardous materials exposure potential.

Additionally, if implementation of the Proposed Action were to violate International Building Code use and occupancy requirements, impacts on occupational safety would be significant. Beneficial impacts would include those reducing occupational health and safety hazards.

4.4.2 Impacts

4.4.2.1 Preferred Alternative

The Preferred Alternative involves the replacement and renovation of the existing cleaning line inside B3001; no renovation or construction activities would occur outside of the B3001 structure. All activities identified in the Preferred Alternative have been designed and sited to comply with all airfield safety criteria and are consistent with guidelines established in the Tinker AFB *General Plan* (Tinker AFB 2005b). The Preferred Alternative includes renovation of the existing process lines and installation of new process lines, cleaning line sensors and controls, water recycling loops, and renovation of the air supply and ventilation system. The Preferred Alternative would eliminate potential safety concerns from the aging cleaning line infrastructure system and would improve environmental and human health hazards currently present with the existing system. Included in the Preferred Alternative would be the removal of piping, abandoned chemical tanks, insulation, and floor deposits and residues; some of these materials may contain asbestos or other hazardous materials and would require proper handling and disposal. Additionally, as presented in Section 4.3, *Hazardous Materials and Wastes*, MSDSs would be maintained on site for all hazardous materials and chemicals utilized in the chemical cleaning process. Further, personnel would continue to regularly attend safety briefs and be trained on proper emergency response and usage of emergency spill kits retained on site. All safety and spill response protocols would remain in place following implementation of the Preferred Alternative.

To meet International Building Code use and occupancy requirements, various fire suppression and detection measures would be incorporated as part of the Preferred Alternative (Tinker AFB 2010b):

- One-hour fire-rated enclosures for the automated cleaning line system and the small parts cleaning line
- One-hour fire rating on the structure enclosing the control room facility
- Water curtains for the load/unload stations of the automated cleaning line (per National Fire Protection Association Code 13, *Standard for the Installation of Sprinkler Systems*)
- Independent fire protection and fire detection systems and lighting installed in control room facility
- Independent fire protection and fire detection systems and lighting in electrical equipment space

In addition, the interior portions of the fire enclosures would be exposed to a corrosive environment due to the chemicals used in the cleaning line system. Appropriate construction materials would be used within the area to ensure proper corrosion resistance.

B3001 is considered to be within a controlled access area; therefore, AT/FP considerations are not required. However, any new exterior windows that are replaced during renovation should meet AT/FP requirements for blast resistance according to Unified Facilities Criteria (UFC) 4-010-01.

Implementation of the Preferred Alternative is anticipated to result in beneficial long-term impacts on occupational safety through the improvement of indoor air quality, installation of fire detection and suppression systems, lighting improvements, and replacement of aging infrastructure.

Accident Potential Zones

All proposed construction activities identified in the Preferred Alternative have been designed and sited to comply with all airfield safety criteria and are consistent with guidelines established in the base's *General Plan* (Tinker AFB 2005b). No facility development is proposed within airfield CZs or APZs; further, implementation of the Preferred Alternative would not result in a change in shape or shift in location of established CZs or APZs. Current land use incompatibilities exist within APZs I and II off Runways 17 and 12, respectively; however, no new incompatible land use would be introduced as a result of implementation of the Preferred Alternative. Therefore, no adverse impacts on airfield safety would result from implementation of the Preferred Alternative.

4.4.2.2 Alternative 2: Simultaneous Replacement of all Chemical Cleaning Line Components

Safety-related impacts under Alternative 2 would be the same as those described for the Preferred Alternative. Under Alternative 2, complete shutdown of all process lines would occur to simultaneously replace all components of the B3001 cleaning line system. The workload would be shifted to B3221, which has existing facilities capable of accommodating a portion of B3001 cleaning line processes, until the replacement in B3001 is complete. Similar to the Preferred Alternative, Alternative 2 would include generation of hazardous materials (e.g., asbestos, chemical residues) during renovation efforts. Safety, handling, and spill response protocols are currently in place and would remain in place for cleaning line operations in B3221. Similar to the Preferred Alternative, Alternative 2 would not result in any impacts on airfield safety, APZs, or CZs. As such, implementation of Alternative 2 would result in no adverse impacts on airfield safety and would result in beneficial impacts on occupational safety due to improved indoor air quality, fire detection and suppression systems, and replacement of aging infrastructure.

4.4.2.3 Alternative 3: No-Action Alternative

If the No-Action Alternative were selected, Tinker AFB would not implement the Proposed Action and the B3001 cleaning line would not be replaced. Therefore, conditions would remain as described in Section 3.5, *Safety*, and existing site conditions would not be improved and potential impacts on personnel safety would continue.

4.5 Socioeconomics

4.5.1 Approach to Analysis

Determination of the significance of impacts to socioeconomic conditions is based on the overall impacts on population, economic activity, and other socioeconomic attributes in the vicinity of the project site and the surrounding region (for this project, the population at Tinker AFB was identified as the surrounding region). For example, potentially beneficial impacts on socioeconomic conditions could result from an action that increases short-term or long-range employment; adverse impacts would result from an action that displaces a large number of people or reduces work productivity with regard to the B3001 cleaning line operations. The following sections discuss potential socioeconomic consequences of the evaluated alternatives.

4.5.2 Impacts

4.5.2.1 Preferred Alternative

Implementation of the Preferred Alternative would involve renovations of the cleaning line area in B3001 to improve the layout and functionality of the existing system. Under the Preferred Alternative, replacement of the cleaning line in B3001 would be implemented in two phases (Tinker AFB 2010b). A phased approach throughout all renovation activities would allow the cleaning line to remain partially in operation during construction activities and would eliminate the need for a complete shutdown of work activities. Aircraft engine parts requiring paint stripping would be redirected to B3221, which has facilities capable of accommodating a portion of the redirected workload, for paint removal operations.

Although renovation activities would occur over two years, which might introduce some changes in workloads to work activities, the chemical cleaning line currently utilizes swing shift scheduling, and work-around options would be implemented, resulting in no gain or loss of personnel associated with the Proposed Action. Therefore, there would be no net change in staff under the Preferred Alternative. The proposed project may generate temporary construction jobs for off-base personnel and regional spending for construction materials purchase. Completing the renovation activities in a phased approach would provide a means to maintain workload productivity during renovation activities; therefore the construction would benefit the local economy, and there would be no long-term impacts on local socioeconomic conditions.

4.5.2.2 Alternative 2: Simultaneous Replacement of all Chemical Cleaning Line Components

Implementation of Alternative 2 would involve the simultaneous replacement of B3001 cleaning line components. Replacing all components simultaneously under Alternative 2 would eliminate the need to phase construction activities and would reduce the duration of project implementation to approximately one or two years. The workload would be temporarily shifted to the B3221 cleaning line while the B3001 cleaning line is completely shut down during renovation. However, B3221 can accommodate only a portion of B3001's cleaning line workload. Excess B3001 cleaning line workload would remain on hold during system shutdown until renovation is complete. Similar to the Preferred Alternative, there would be no permanent change in personnel associated with the Proposed Action; however, complete shutdown might result in temporary layoffs or require furlough time for some personnel during renovation. Short-term adverse impacts on local socioeconomics under Alternative 2 would occur if layoffs and furlough time is required. Alternative 2 would not result in long-term impacts on socioeconomic conditions.

4.5.2.3 Alternative 3: No-Action Alternative

If the No-Action Alternative were selected, Tinker AFB would not implement the Proposed Action and the B3001 cleaning line would not be replaced. Therefore, socioeconomic conditions would remain as described in Section 3.5, *Socioeconomics*, and no construction-related impacts would occur.

4.6 Sustainability

4.6.1 Approach to Analysis

To comply with EO 13514, the project has been evaluated for its impact on the federal government's goal to reduce GHG emissions by reducing energy consumption through strategic sustainable development, energy-efficient building design, and environmentally friendly building material selection. The project alternatives have been evaluated for their adherence to EO 13514 and the *Federal Leadership in High Performance and Sustainable Buildings Memorandum of Understanding* referenced within EO 13514, as it pertains to identifying energy-reduction opportunities and siting considerations. The following sections discuss potential environmental sustainability consequences of the evaluated alternatives.

4.6.2 Impacts

4.6.2.1 Preferred Alternative

Implementation of the Preferred Alternative would renovate and upgrade the existing cleaning line to a system capable of accommodating current and programmed workload in a manner that provides better system control, energy efficiency, and improved occupational safety. The proposed improvements under the Preferred Alternative would save approximately \$2.76 million

in annual utility costs (e.g., energy and water) following completion of the project, approximately five years (Tinker AFB 2010a). The proposed cleaning line would be enclosed and would include a makeup air system. The cleaning line is the greatest consumer of air in B3001, and a makeup air system devoted to the cleaning line would greatly reduce the workload on the B3001 air systems resulting in increases efficiency. The Preferred Alternative would include automation that would reduce water consumption by 93 percent (Tinker AFB 2011b). Other proposed automation changes would have significant reductions in air, exhaust, electricity, steam usage, and building heating, ventilation, and air conditioning (Tinker AFB 2011b). Additionally, the renovated system would reduce the annual quantity of industrial wastewater conveyed to the treatment plant as well as the consumption rate of chemical resources due to the efficiency improvements included in the Preferred Alternative. The Preferred Alternative would reduce energy consumption of the chemical cleaning line by 94 percent for most operations, compared to existing conditions (Tinker AFB 2011b). Therefore, impacts anticipated under the Preferred Alternative would be beneficial to the overall sustainability goals for Tinker AFB and would bring the cleaning line and associated operations in compliance with EO 13514.

4.6.2.2 Alternative 2: Simultaneous Replacement of all Chemical Cleaning Line Components

Impacts related to sustainability associated with Alternative 2 would be similar to those described for the Preferred Alternative. However, under Alternative 2 a complete shutdown of all process lines would occur to replace all components of the B3001 cleaning line simultaneously. The complete shutdown of the existing cleaning line would allow for all proposed renovations to be implemented in a shorter period of time (approximately one to two years) than the Preferred Alternative. Annual utility savings of approximately \$2.76 million for Tinker AFB would occur immediately following the one- to two-year construction period. Therefore, beneficial impacts on sustainability under Alternative 2 would result by bringing the cleaning line and associated operations in compliance with EO 13514, by providing annual utility savings, and by reducing chemical and energy resource use. Beneficial impacts of Alternative 2 would occur sooner than beneficial impacts of the Preferred Alternative.

4.6.2.3 Alternative 3: No-Action Alternative

If the No-Action Alternative were selected, Tinker AFB would not implement the Proposed Action and the B3001 cleaning line would not be replaced. Therefore, conditions would remain as described in Section 3.6, *Sustainability*, and sustainability impacts would continue. Inefficient energy use and annual utility expenses would remain at high levels.

4.7 Water Resources

4.7.1 Approach to Analysis

Significance criteria for water resources impacts are based on water availability, quality, and use. An impact on water resources would be significant if it would (1) reduce water availability to or interfere with the supply of existing users, (2) create or contribute to overdraft of groundwater

basins or exceed safe annual yield of water supply sources, (3) adversely affect water quality or endanger public health by creating or worsening adverse health hazard conditions, (4) threaten or damage unique hydrologic characteristics, or (5) violate established laws or regulations that have been adopted to protect or manage water resources of an area.

4.7.2 Impacts

4.7.2.1 Preferred Alternative

Surface Water

Implementation of the Preferred Alternative would not involve ground-disturbing activities. Implementation of the Proposed Action would occur only within the interior of B3001 and B3221 and would not alter the existing building footprints. No surface water resources (e.g., lakes, streams, wetlands, floodplains) are in the immediate vicinity of B3001 or B3221. If new scrubbers are added, exposed portions would be constructed of non-galvanized materials to prevent introduction of zinc into storm water. Long-term operations of the system would have no affect on surface water. Therefore, impacts to wetlands or floodplains would not result, and conditions would remain unchanged from existing conditions.

Groundwater

It is unlikely that groundwater quality would be adversely affected by the Preferred Alternative, assuming required controls for the handling of hazardous materials and spill prevention and cleanup are implemented properly.

Implementation of the Preferred Alternative would not result in an increase in impermeable surfaces and would have no impact to groundwater aquifer recharge capacity. Further, the Preferred Alternative would result in beneficial impacts through reduced water consumption. The project site does not overlie an identified groundwater recharge zone of special significance, and the footprint of facility development is negligible with regard to groundwater area below the region. Therefore, implementation of the Preferred Alternative would result in negligible impacts on groundwater resources.

Wastewater

Potential impacts from the transport of associated construction material and equipment would be minimized throughout the proposed project area through implementation of existing nonpoint pollution requirements and spill prevention and response procedures.

The Preferred Alternative would result in beneficial impacts through reduced wastewater load to the IWTP; therefore, under implementation of the Preferred Alternative, impacts on wastewater resources would be beneficial and not significant.

4.7.2.2 Alternative 2

Alternative 2 would involve the simultaneous replacement of all components of the B3001 cleaning line, with workload temporarily shifted to B3221 during the replacement activities. Similar to the Preferred Alternative, Alternative 2 would not result in an increase in impermeable surfaces, would result in beneficial impacts through reduced water consumption and reduced wastewater load to the IWTP, and would have no impact to groundwater aquifer recharge capacity. Therefore, implementation of Alternative 2 would result in negligible impacts on groundwater resources.

4.7.2.3 No-Action Alternative

If the No-Action Alternative were selected, Tinker AFB would not implement the Proposed Action and the B3001 cleaning line would not be replaced. Therefore, conditions would remain as described in Section 3.7, Water Resources. Water consumption and wastewater load would remain at current levels.

THIS PAGE INTENTIONALLY LEFT BLANK

SECTION 5.0 CUMULATIVE IMPACTS

Cumulative impacts on environmental resources result from incremental impacts of the Preferred Alternative when combined with other past, present, and reasonably foreseeable future projects in an affected area. Cumulative impacts can result from minor but collectively substantial actions undertaken over a period of time by various agencies (federal, state, or local) or persons. In accordance with NEPA, the cumulative impacts resulting from projects that are proposed, under construction, recently completed, or anticipated to be implemented in the near future are discussed below.

Projects occurring in other areas of Tinker AFB and in the vicinity of Tinker AFB are included in Table 5-1.

Table 5-1. Projects Occurring at or near Tinker AFB

Project	Overview
Demolition of B3108	B3108 is scheduled for demolition in plans currently under development. The demolition will take place over the course of a 5- to 10-year period.
Construct Air Traffic Control Tower	Construct a new 11-story air traffic control tower. Construction would include reinforced concrete piers, a control tower cab with tinted double glazing, an elevator, a flight command and administrative area, and a supervision and simulation training area as well as fire protection, utilities, backup power, lighting protection, access road, and any other necessary support for a complete and useable facility. Project to include minimum DoD AT/FP requirements and demolition of existing control tower and access road.
Construct T9 Test Cell at TACX	Construction of a new T9 noise suppression system (test cell) is required to be constructed at the TACX. This project would include a T-9 style engine testing facility, jet engine fuel storage and delivery system, utilities, building, and access driveways and parking. These facilities would allow continuous support of military jet engine repair performed at TACX, as well as provide the 76 MXW and 76 Propulsion Maintenance Group capabilities to meet mission requirements of delivering engines on time and on cost. The T9 Test Cell would also provide temporary backup facilities in case of failure of other engine testing facilities on Tinker AFB.
Steam Decentralization Project	The project consists of decentralizing and optimizing the operation of four central steam plants (CSPs) in separate buildings on Tinker AFB. These four steam plants are connected to 71 buildings that comprise 9,090,704 sf and represent approximately 48 percent of the total building area at Tinker AFB. The purpose of the project is to improve the efficiency and operations and maintenance of the central steam distribution system on Tinker AFB to meet mandated energy reduction goals, reduce utility costs, and provide service in a maintenance-friendly manner.

Table 5-1. Projects Occurring at or near Tinker AFB (Continued)

Project	Overview
MROTC Lease	Leasing the MROTC is proposed in order to secure workload capacity for the 76 Aircraft Maintenance Group (AMXG) aircraft maintenance and modification operations. The MROTC is located east of Tinker AFB and is bordered by Douglas Boulevard on the west and SE 59th Street on the south.
Henry Twaddle Facility Acquisition	The U.S. Army Reserve's 95th Division (Institutional Training) would move to Fort Sill, Oklahoma. The division is currently based at the Major General Harry Twaddle U.S. Armed Forces Reserve Center in Oklahoma City. The 152,000 sf reserve center would be acquired by Tinker AFB.
B3001 Renovation – Hangar Door and Two-Story Lean-to	Design and construction of a hangar door addition along the west side of the south wing of B3001 to accommodate KC-135 aircraft. The hangar door would be a horizontal sliding hangar door and the accompanying supporting structure. In addition, demolition of an existing single-story lean-to and two-story brick administrative lean-to would be performed to provide space for a new two-story administrative lean-to approximately 10,800 sf. The new lean-to would provide space for restrooms, open office space, utility space, and ADA-compliant elevator. The lean-to would be constructed of brick veneer and standing seam metal roof.
TACX Acquisition	TACX, formerly the Oklahoma City General Motors Assembly Plant was acquired through a lease transaction with Oklahoma County in September 2008. Approximately 3.8 million square feet of facilities were acquired and construction occurred for perimeter security, gate access, road construction and extension of existing roads as well as the construction of a T-9 Test Cell. The lease transaction allowed for the relocation of commodity shops consisting of sheet metal production, composites production, machining/manufacturing and cleanroom space as well as additional production lines. The Software group moved five of their squadrons to TACX to provide software support for the weapon systems serviced at Tinker AFB. The Propulsion, Maintenance, Defense Logistics Agency, and other mission support activities have also been moved to TACX.

The projects listed above are planned for construction at roughly the same time that implementation of the Preferred Alternative would occur. Consequently, the potential exists for cumulative environmental impacts to occur with regard to air quality and traffic. Cumulative air quality impacts are expected to be negligible since all projects would be required to implement BMPs to reduce air emissions below significance thresholds.

With regard to traffic and circulation, if the construction projects described above were to occur concurrently with the Preferred Alternative on Tinker AFB, short-term impacts on traffic caused by additional construction equipment and construction workers traveling along surrounding roadways could potentially cause a short-term, adverse cumulative impact during peak traffic hours. However, construction activities would not be permanent, and construction equipment would remain on-site, kept off of roads, and would not create an ongoing circulation conflict.

Traffic on base could ultimately be improved by the reconfiguration of roadways proposed by other concurrent base projects as identified in Table 5-1. Cumulative impacts on transportation and circulation related to construction could be expected to be significant if all projects were to occur simultaneously. If the construction projects described above were to occur separately, construction-related impacts to transportation and circulation would be temporary and would be expected to be less than significant; overall long-term beneficial impacts would be anticipated due to reconfigured roadways, parking, and gate facilities.

The Preferred Alternative and the projects described above include sustainability goals in order to bring operations in compliance with EO 13514, *Federal Leadership in Environmental, Energy, and Economic Performance*. These goals include improved operational control, energy efficiency, reduction in waste, reduction in annual utility costs, and improved occupational safety. Therefore, cumulative impacts with regard to sustainability are expected to be beneficial.

THIS PAGE INTENTIONALLY LEFT BLANK

SECTION 6.0

REFERENCES

- Air Force Instruction (AFI) 32-7040. *Air Quality Compliance and Resource Management*.
- Association of Central Oklahoma Governments (ACOG). 2008. Central Oklahoma 8-Hour Ozone Flex Program for 2008-2012. 4 April.
- Council on Environmental Quality (CEQ). 1978. *Regulations for Implementing the Procedural Provisions of the National Environmental Policy Act*. Title 40, Code of Federal Regulations Parts 1500 through 1508. Washington, DC: U.S. Government Printing Office.
- Department of Defense (DoD). 2010. *Memorandum for Acting Assistant Secretary of the Army/Navy/Air Force, RE: DoD Implementation of Storm Water Requirements under Section 458 of the Energy Independence and Security Act (EISA)*. 19 January 2010.
- Executive Order (EO). 13514, *Federal Leadership in Environmental, Energy, and Economic Performance*. Effective Date: 23 December 2009.
- Greater Oklahoma City Chamber of Commerce. 2010. Oklahoma City Area Major Employers. Accessed at <http://www.greateroklahomacity.com/index.php?submenu=majoremployers&src=directory&view=employers> on 11 October 2010.
- Oklahoma City Convention and Visitors Bureau. 2010. *Oklahoma City History*. Accessed at http://www.okccvb.org/index.php?submenu=about_history&src=gendocs&ref=History&category=History on 15 October 2010.
- Oklahoma Department of Environmental Quality (DEQ), Air Quality Division. 2010. Title V Permit, October 2008. Permit No. 99-104-TV (M-4), Tinker AFB Facility-Wide Operating Permit. Accessed at ftp://ftp.deq.state.ok.us/DEQ%20Public/AQD/Issued_Permits on 4 May 2010.
- Parkhurst, D.L., S. Christenson and G.N. Breit. 1993. *Ground-Water-Quality Assessment of the Central Oklahoma Aquifer, Oklahoma: Geochemical and Geohydrologic Investigations*. U.S. Geological Survey Open-File Report 92-642.
- Tinker Air Force Base (AFB). 2002. *Storm Water Pollution Prevention Plan*. October.
- _____. 2004a. *OC-ALC Plan 19-2, Spill Prevention and Emergency Response Plan for Hazardous and Extremely Hazardous Material and Spill Prevention Control and Countermeasures Plan, Tinker Air Force Base, Oklahoma*. October.
- _____. 2004b. *Community Relations Plan for the Installation Restoration Program and Resource Conservation & Recovery Act*. March.

- _____. 2005a. *Final Integrated Cultural Resources Management Plan for Tinker Air Force Base, Oklahoma City, Oklahoma*. December.
- _____. 2005b. *Tinker Air Force Base General Plan*. Oklahoma: Tinker AFB.
- _____. 2006. *Air Installation Compatible Use Zone Study*. Oklahoma: Tinker AFB. December.
- _____. 2007. *Integrated Natural Resources Management Plan 2007-2011*.
- _____. 2009. *Environmental Compliance Assessment and Management Program, FY 2009 Final Report*. Tinker Air Force Base, Oklahoma. 15 September.
- _____. 2010a. *76th PMXG Chemical Cleaning Line v3*. PowerPoint presentation provided by R. Renfro, 76 PMXG/QPE. 9 September.
- _____. 2010b. *Rehabilitate Central Engine Cleaning Line, Building 3001, Tinker AFB, Oklahoma*. Requirements Document. 17 April.
- _____. 2010c. *Tinker Air Force Base Fact Sheet*. March. Accessed at <http://www.tinker.af.mil/library/factsheets/factsheet.asp?fsID=9404&page=3> on 16 April 2010.
- _____. 2010d. *Tinker AFB Fiscal Year 2010 Annual Utility Review*. November.
- _____. 2010e. *Community Relations Plan. Installation Restoration Program and Resource Conservation and Recovery Act*. Oklahoma: Tinker AFB. November.
- _____. 2011a. *RCRA Facility Assessment Vapor Intrusion in Areas A and B on Tinker Air Force Base, Oklahoma*. January.
- _____. 2011b. *76th PMXG Metal Parts Chemical Cleaning Line Renovation Project*. PowerPoint presentation provided by P. Garnaas, PE, Sain Engineering Associates.

Tinker Air Force Base Instruction 32-7004.

- U.S. Census Bureau. 2008. *American FactFinder – 2006-2008 American Community Survey 3-Year Estimates*. Accessed at <http://factfinder.census.gov> on 19 November 2010.
- U.S. Bureau of Labor Statistics. 2010. *Local Area Unemployment Statistics (2000-2009)*. Accessed at <http://data.bls.gov:8080/PDQ/outside.jsp?survey=la> on 19 November 2010.
- U.S. Department of Agriculture. 2003. *Soil Survey of Oklahoma County, Oklahoma*. Prepared by Natural Resources Conservation Service in cooperation with the Oklahoma Agricultural Experiment Station and the Oklahoma Conservation Commission.

- U.S. Environmental Protection Agency (EPA). 2008. Care for Your Air: A Guide to Indoor Air Quality. September. Accessed at <http://www.epa.gov/iaq/pubs/careforyourair.html> on 18 January 2011.
- _____. 2010a. *Proposed Rules: Public Hearings for Reconsideration of the 2008 National Ambient Air Quality Standards for Ozone*. Title 40, Code of Federal Regulations Parts 50 and 58. RIN 2060-AP98. EPA-HQ-OAR-2005-0172; FRL-9102-3. 75 *Federal Register* 7. 12 January. pp. 1566-1567.
- _____. 2010b. *Rules and Regulations: Primary National Ambient Air Quality Standards for Nitrogen Dioxide; Final Rule*. Title 40, Code of Federal Regulations Parts 50 and 58. RIN 2060-AO19. EPA-HQ-OAR-2006-0922; FRL-9107-9. 75 *Federal Register* 26. 9 February. pp. 6474-6537.
- _____. 2010f. *Prevention of Significant Deterioration and Title V Greenhouse Gas Tailoring Rule*. Title 40, Code of Federal Regulations Parts 51, 52, 70, and 71. 75 *Federal Register* 106. 3 June. EPA-HQ-OAR-2009-0517, FRL-9152-8. Accessed at <http://www.epa.gov/NSR/actions.html> on 2 February 2011.
- _____. 2011a. *Criteria Pollutant Area Summary Report*. Accessed at <http://epa.gov/airquality/greenbk/anc12.html> on 19 January 2011. Website last updated on 17 December 2010.
- _____. 2011b. National Ambient Air Quality Standards (NAAQS). Accessed at <http://epa.gov/air/criteria.html>. Accessed on 19 December 2011.
- U.S. Green Building Council. 2010. Intro – What LEED Is. Accessed at <http://www.usgbc.org/DisplayPage.aspx?CMSPageID=1988> on 4 October 2010.

THIS PAGE INTENTIONALLY LEFT BLANK

SECTION 7.0

LIST OF PREPARERS

This report was prepared for, and under the direction of, the Air Force Center for Engineering and the Environment by AMEC Earth and Environmental, Inc. Members of the professional staff are listed below:

Project Management

Aaron Goldschmidt, Program Manager

M.A. Geography

Marcie Martin, RPES, Project Manager

M.S. Environmental Management and Industrial Hygiene

Technical Analysts

Theresa Price, Environmental Planner

M.S. Applied Biological Sciences (Botany & GIS)

Crystal Gerrity, CEP, Environmental Planner

M.S. Environmental Science

Joe Pisano, Air Quality & Compliance Specialist

B.S. Environmental Science

Steve Ochs, Chemical and Air Quality Engineer

M.S. Chemical Engineering

David Larsen, RPA, Environmental Planner

M.A. Archaeology and Heritage

Production

Paul Barbera, GIS Analyst

M.S. Geology

Maggie Fulton, Technical Editor

B.A. English

Katie Murphy, Document Specialist

B.F.A Drawing

Kristen Knutson, Document Specialist

THIS PAGE INTENTIONALLY LEFT BLANK

APPENDIX A

PUBLIC AND AGENCY SCOPING

THIS PAGE INTENTIONALLY LEFT BLANK



DEPARTMENT OF THE AIR FORCE
HEADQUARTERS 72D AIR BASE WING (AFMC)
TINKER AIR FORCE BASE OKLAHOMA

MEMORANDUM FOR: SEE DISTRIBUTION

JAN 23 2012

FROM: 72 ABW/CEANO
7535 Fifth Street, Building 400
Tinker Air Force Base, Oklahoma 73145

SUBJECT: Environmental Assessments (EAs), Repair and Renovation of the Airborne Warning and Control System at the Maintenance (AWACS) Group Complex in Building 230, Replacement of the Chemical Cleaning Line, and Construction of an Addition to Building 820, Tinker Air Force Base (TAFB)

1. TAFB has prepared three EAs in accordance with the National Environmental Policy Act and placed these documents for public review and comment. These EAs analyze the potential environmental and socioeconomic impacts associated with the three individual projects to Renovate Building 230, Replace the Chemical Cleaning Line in Building 3001, and to Construct an Addition to Building 820. We request your participation in the environmental impact analysis process, and we solicit any particular concerns or recommendations that you may have regarding any aspect of these projects.

2. Repairing and Renovating Building 230 involves the improvement and modernization of the interior space of the 552nd Air Control Wing (ACW) Maintenance Group Complex at Tinker Air Force Base. This project would remedy the current inadequacy of Building 230 to accommodate the full workload of current and future maintenance of AWACS aircraft by the 552d ACW. Included in the Proposed Action is the repair, renovation and modernization of B230, its four maintenance hangars, associated administrative and shop areas to allow the 552d ACW to inspect, service, and maintain AWACS aircraft safely and effectively. The renovated facility would also comply with the antiterrorism/force protection requirements of the U.S. Department of Defense and would incorporate sustainable energy-efficient design principles.

The EA prepared for the Chemical Cleaning Line evaluated the environmental effects associated with replacing the existing Cleaning Line in Building 3001. Replacement of the existing line would provide a more energy-efficient operation that would reduce water and chemical usage, generate cost savings for overall cleaning line system operations and accommodate larger engine parts.

The EA prepared for the Addition to Hangar Building 820 evaluated the environmental impacts associated with the construction of a Type II aircraft maintenance hangar addition to Building 820. Included with the Proposed Action is the construction of associated aircraft access and parking aprons. The proposed single bay hangar would be constructed as an addition to and located at the west end of B820. The hangar would be designed for fuel cell maintenance operations and would provide maintenance, crew, equipment and other support space for the US Navy Strategic Communications Wing One's E-6B Mercury aircraft squadrons.

3. No significant environmental impacts were identified for any of the EAs and the investigations resulted in Findings of No Significant Impacts for all three projects.

4. The draft EAs are available at the Tinker Information Repository in the Midwest City Public Library at 8143 East Reno Avenue, Midwest City, Oklahoma. Hours of operations are 9:00 a.m. to 9:00 p.m., Monday through Thursday; 9:00 a.m. to 6:00 p.m., Friday; 9:00 a.m. to 5:00 p.m., Saturday; and 1:00 to 6:00 p.m. on Sunday.

5. Thank you for your assistance with this matter and we look forward to your involvement with these projects. If you would prefer that we send an electronic copy to your office please e-mail or direct any questions to Ms. Cynthia Garrett, cynthia.garrett@tinker.af.mil, (405) 734-2097.

A handwritten signature in blue ink that reads "Trudi Logan". The signature is fluid and cursive, with a long horizontal line extending from the end of the name.

TRUDI LOGAN, Chief
Environmental Operations, Engineering Section
Environmental Management Division

Distribution List:

Association of Central Oklahoma Governments
Audubon Society of Central Oklahoma
City of Del City
City of Midwest City
City of Oklahoma City, Planning Department
City of Oklahoma City, Ward #?
EPA Region VI, Compliance Assurance and Enforcement Division (6EN-XP)
Federal Emergency Management Association (FEMA)
Greater Oklahoma City Chamber of Commerce, Government Relations
Oklahoma Corporation Commission
Oklahoma County, District Two
Oklahoma Department of Environmental Quality, Customer Services Division
Oklahoma Department of Transportation, Planning and Research Division
Oklahoma Department of Wildlife Conservation
Oklahoma Geologic Survey
Oklahoma Water Resources Board, Planning and Management Division
Oklahoma Wildlife Federation
Sierra Club, Oklahoma Chapter
State Historic Preservation Office (SHPO) (Oklahoma)
The Osage Nation
The Muscogee (Creek) Nation
The Seminole Nation of Oklahoma
Tinker AFB Community Advisory Board Members
U.S. Army Corps of Engineers, Tulsa District, Planning and Environmental Division
U.S. Department of Agriculture, Natural Resources Conservation Service
U.S. Fish and Wildlife Service, Division of Ecological Services

Coachella festival unveils expanded lineup

BY TODD MARTENS
Los Angeles Times

LOS ANGELES — Rapper Dr. Dre will close the 2012 edition of the Coachella Valley Music & Arts Festival, set for the first time over two consecutive weeks in mid-April. Headliners for the multi-weekend, six-day affair include rock acts the Black Keys, Radiohead and the Shins, as well as hip-hop and dance acts Snoop Dogg, the Swedish House Mafia and Kaskade, among others.

Stillwater-based orchestral pop-rock quartet Other Lives, which is touring with Radiohead in February and March, is on the lineup for the first Friday of the event, April 13 and 20.

The festival will host a number of artists on the reunion circuit. Brit-pop band Pulp, hard-core Swedish punk band Refused, Mike Watt's post-Manitoba band FIRE-HOSE and experimental Texas rockers At the Drive-In are among those on the comeback trail.

The headliner each Sunday night is Dr. Dre, something of a revival act himself. Though he's stayed in the public eye via his branding efforts and production work, the

Compton, Calif.-raised artist has not released an album since 1999 and has spent much of the last decade working on his long-rumored "Detox."

Coachella, run by AEG-owned concert promoter Goldenvoice, will take place over two consecutive weekends, the first on April 13-15 and the second on April 20-22. Each weekend is a separate ticket, priced at \$235 and on sale Friday. Paul Tollett, who heads Goldenvoice and has organized the festival since its 1999 inception, said last year that the expansion was in reaction to the increased demand for tickets.

"The thought of this selling out super quick, and the only people who get to go are the people who bought the first run of tickets for more than they sold for, that didn't seem great to us," Tollett said. "We didn't want to go with more people and ruin the experience. We can't add a midnight show, and we didn't want to add another city or raise the ticket price. So we decided to add another weekend."

The lineup was unveiled Monday on the Goldenvoice and Coachella Facebook pages. Tickets were initially sold

for the 2012 festival nearly a year in advance of the event. In previous years, tickets were not sold until the lineup had been revealed, and were sold via Ticketmaster. Tickets were again priced at \$235, not including service fees.

Coachella will close with Dr. Dre and Snoop Dogg on the two Sunday evenings, while rock acts will get top billing the other nights. The Black Keys will anchor a Friday that will also feature singer-songwriter Cat Power, reggae legend Jimmy Cliff

and psychedelic electronic act MKB. Radiohead will close the festival's Saturday evenings, with indie star Ben Folds and reclusive rocker Jeff Mangum also on the bill.

Coachella is coming off its second consecutive

sellout year, hosting about 100,000 people per day. The event, held at the Empire Polo Grounds in Indio, Calif., is considered the unofficial kickoff to the summer festival season.

LOS ANGELES TIMES

PAID ADVERTISEMENT

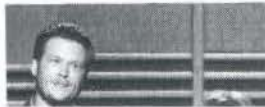
PUBLIC NOTICE

Tinker Air Force Base Invites Public Comment On Three Draft Environmental Assessments (EAs) for Repair and Renovation Building 230 Replacement of Chemical Cleaning Lines Construction of Hangar Addition to Building 820

Tinker Air Force Base has prepared three Environmental Assessments (EAs) which are available for public review and comment. Pursuant to the Council on Environmental Quality (CEQ) regulations and in accordance with the National Environmental Policy Act, EAs have been prepared to evaluate the potential effects on the human and natural environment associated with three Proposed Actions: Repair and Renovation of Building 230 involves the improvement and modernization of the interior space of the 552nd Air Control Wing (ACW) of current and future maintenance of E-3 Sentry Airborne Warning and Control System (AWACS) aircraft by the 552nd ACW. Included in the Proposed Action is the repair, renovation and modernization of B230, its four maintenance hangars, associated administrative and shop areas to allow the 552nd ACW to support, service, and maintain E-3 Sentry aircraft safely and effectively. The renovated facility would also comply with the environmental protection requirements of the U.S. Department of Defense and would incorporate sustainable energy efficient design principles. The EA prepared for the Chemical Cleaning Line evaluated the environmental effects associated with replacing the existing Cleaning Line in Building 3891. Replacement of the existing line would provide a more energy efficient operation that would reduce water and chemical usage, generate less waste, and avoid cleaning line system operations and associated larger engine parts. The EA prepared for the Addition to Hangar Building 820 evaluated the environmental impacts associated with the construction of a Type II aircraft maintenance hangar addition to Building 820 at Tinker AFB. Included with the Proposed Action is the construction of associated aircraft and parking aprons. The proposed single bay hangar would be constructed as an addition to and located at the west end of 8805. The hangar would be designed for fuel oil maintenance operations and would provide maintenance, crew, equipment and other support space for the US Navy Strategic Communications Wing One's E-4B Sentry aircraft operations. No significant environmental impacts were identified for any of the EAs and the investigations resulted in Findings of No Significant Impacts for all three projects.

The public is invited to review any or all of the draft EAs and make comments. Written comments and questions on any EA can be submitted before close of business on January 27, 2012. The draft EA is available to the public at the Tinker Information Repository in the Midwest City Public Library at 8143 East Reno Avenue, Midwest City, Oklahoma. Hours of operation are 9:00 a.m. to 5:00 p.m., Monday through Thursday; 9:00 a.m. to 6:00 p.m., Friday; 9:00 a.m. to 6:00 p.m., Saturday; and 1:00 to 4:00 p.m. on Sunday. The public may submit written comments, identifying the EA in question, to the address below.

720 Air Base Wing Public Affairs Office
Brian Ockenfels
7450 Arnold Ave., Suite 127
Tinker Air Force Base, Oklahoma 73145
Phone: 405-739-2027/26
E-mail: brian.ockenfels@tinker.af.mil



THE OKLAHOMAN
LEGAL
www.NewsOK.com/LEGALNOTICES
To PLACE A LEGAL NOTICE CALL: 475-4022

STATE OF OKLAHOMA, } ss.
COUNTY OF OKLAHOMA }

Affidavit of Publication

Gina Calame, of lawful age, being first duly sworn, upon oath deposes and says that he is the rep of The Oklahoma Publishing Company, a corporation, which is the publisher of the The Oklahoman which is a daily newspaper of general circulation in the State of Oklahoma, and which is a daily newspaper published in Oklahoma County and having paid general circulation therein; that said newspaper has been continuously and uninterruptedly published in said county and state for a period of more than one hundred and four consecutive weeks next prior to the first publication of the notice attached hereto, and that said notice was published in the following issues of said newspaper, namely:

page 5 4 x 5 ad
on 1/13/12

Subscribed and sworn to before me this 13

day of January, 20 12

Royce A. Parkhurst

Notary Public

My commission expires 07/24/12



Gina Calame

PUBLIC NOTICE

Tinker Air Force Base Invites Public Comment On Three Draft Environmental Assessments (EAs) for Repair and Renovation Building 230 Replacement of Chemical Cleaning Lines Construction of Hangar Addition to Building 820

Tinker Air Force Base has prepared three Environmental Assessments (EAs) which are available for public review and comment.

Pursuant to the Council on Environmental Quality (CEQ) regulations and in accordance with the National Environmental Policy Act, EAs have been performed to evaluate the potential effects on the human and natural environment associated with three Proposed Actions.

Repairing and Renovation of Building 230 involves the improvement and modernization of the interior space of the 552nd Air Control Wing (ACW) Maintenance Group Complex at Tinker Air Force Base. This project would remedy the current inadequacy of Building 230 to accommodate the full workload of current and future maintenance of E-3 Sentry Airborne Warning and Control System (AWACS) aircraft by the 552nd ACW. Included in the Proposed Action is the repair, renovation and modernization of Building 230, its four maintenance hangars, associated administrative and shop areas to allow the 552nd ACW to inspect, service, and maintain E-3 Sentry aircraft safely and effectively. The renovated facility would also comply with the antiterrorism/force protection requirements of the U.S. Department of Defense and would incorporate sustainable energy-efficient design principles.

The EA prepared for the Chemical Cleaning Line evaluated the environmental effects associated with replacing the existing Cleaning Line in Building 3001. Replacement of the existing line would provide a more energy-efficient operation that would reduce water and chemical usage, generate cost savings for overall cleaning line system operations and accommodate larger engine parts.

The EA prepared for the Addition to Hangar Building 820 evaluated the environmental impacts associated with the construction of a Type II aircraft maintenance hangar addition to Building 820 at Tinker AFB. Included with the Proposed Action is the construction of associated aircraft access and parking aprons. The proposed single bay hangar would be constructed as an addition to and located at the west end of Building 820. The hangar would be designed for fuel cell maintenance operations and would provide maintenance, crew, equipment and other support space for the US Navy Strategic Communications Wing One's E-6B Mercury aircraft squadrons.

No significant environmental impacts were identified for any of the EAs and the investigations resulted in Findings of No Significant Impacts for all three projects.

The public is invited to review any or all of the draft EAs and make comments. Written comments and questions on any EA can be submitted before close of business on January 27, 2012.

The draft EA is available to the public at the Tinker Information Repository in the Midwest City Public Library at 8143 East Reno Avenue, Midwest City, Oklahoma. Hours of operations are 9 a.m. to 9 p.m. Monday through Thursday; 9 a.m. to 6 p.m., Friday; 9 a.m. to 5 p.m. Saturday; and 1 to 6 p.m. Sunday.

The public may submit written comments, identifying the EA in question, to the address below:

72d Air Base Wing Public Affairs Office

Brion Ockenfels

7460 Arnold Ave., Suite 127

Tinker Air Force Base, OK 73145

Phone: 405-739-2027/26 • E-mail: brion.ockenfels@tinker.af.mil

PUBLIC NOTICE

Munitions Response Site Prioritization Protocol (MRSP) Tinker AFB, Oklahoma City, OK

WHY YOU ARE BEING NOTIFIED: For decades, the Department of Defense (DOD) has used military munitions in training and testing to ensure force readiness. Munitions contamination remaining from past DOD activities may present explosive, chemical agent, human health and environmental hazards. Whenever a former range or disposal site is put to another use, actions must be taken to ensure cleanup of any remaining hazards. Therefore, Congress directed DOD to identify and prioritize all Historic, out of service Munitions Response Sites in their inventory, thus establishing the Military Munitions Response Program. The Munitions Response Site Prioritization Protocol was established to assign each former munitions site a relative priority for response activities based on the overall condition at each location. There are three modules that make up the protocol: the Explosive Hazard Evaluation, the Chemical Weapons Material Hazard Evaluation and the Health Hazard Evaluation. Each module is scored using specific criteria and the module with the highest ranking determines the priority for the site.

At Tinker AFB, five former training areas were evaluated under the MRSP: Skeet Range #1 (MM90), Skeet Range #2 (MM93), Firing-In Buttress #2 (MM92), Ordnance Disposal Area (WP51), and 38th EIG Small Arms Range (MM94). The United States Air Force is seeking public participation, review and comment on this evaluation.

WHERE YOU CAN FIND FURTHER INFORMATION: A copy of the MRSP determination for these sites at Tinker AFB is available to the public at the Midwest City Public Library, 8143 E. Reno, Midwest City, OK 73110-7589. The evaluation criteria are available for public review until February 13, 2012. Members of the public can address written comments on the MRSP scoring to: Mr. Brion Ockenfels, 72 ABW/PA 7460 Arnold St, Ste. 127, Tinker AFB, OK 73145, phone (405) 739-2026